Department of Education

Учиться дома
7-й класс

Май 2009 г.

Уважаемые учащиеся седьмого класса!

В настоящее время мы столкнулись с трудной и нестандартной ситуацией, когда на неделю закрываются некоторые школы. Мы понимаем, что перерыв в школьных занятиях может быть проблемой для вас и для вашей семьи. Однако даже если ваша школа закрыта, это время можно использовать для продолжения учёбы.

Чтобы помочь себе не выбиться из учебной колеи:

- Каждый день читайте книги, журналы или газеты по своему выбору
- Каждый день изучайте и используйте новые словарные слова
- Пишите каждый день. Например:
    - Напишите письмо президенту Обаме на тему, которая вам интересна
    - Заведите дневник и записывайте в него произошедшее за день, свои мечты, пишите о своих друзьях, о своей семье и своих планах.
    - Напишите обычное или электронное письмо своему учителю о учебных предметах и видах занятий, которые вам больше всего нравятся в школе
    - Напишите обычное или электронное письмо родственнику или другу
    - Напишите короткий рассказ, стишок или текст песни
- Занимайтесь физической культурой и/или творческой деятельностью, чтобы поддерживать в форме своё тело и ум
- Просматривайте свои школьные записи и книги
- Ежедневно обсуждайте то, что вы изучили за день, со своими родителями или опекунами

На последующих страницах вы найдёте руководство для ежедневных занятий, которое поможет вам оставаться организованным и не выбиться из учебной колеи. Оно содержит рекомендуемое расписание, виды занятий, а также образовательные телевизионные программы и вебсайты. Пожалуйста, воспользуйтесь этим руководством и ежедневно заполняйте таблицу, отмечая в ней изученное за день.

За дополнительными веб-ресурсами и обновлёнными материалами заходите на сайт: http://schools.nyc.gov/learnathome.

Day 1 Schedule

Subject	Minutes Per Day (At Least!)	Assignments	What Did I Learn Today?
English Language Arts	45	• Learn new vocabulary words from the Vocabulary List • Activity 1: Reading • Activity 2: Writing	•
Math	45	• Skill 1 - Variables and Expressions	•
Science	45	Complete at least one of the following activities: • Activity 1: *Earthquake Shakes Japan (English or Spanish)* • Activity 2: *Science Inquiry Project – Geology*	•
Fitness and Health	30	• Exercise for 30 minutes. Choose from the Activity Calendars at the back of this booklet.	•
Arts	30	• Choose one or two activities from the Dance Activities at the back of the booklet	•
TV Shows and Websites	30	• Choose TV shows and websites to further your learning at home	•

Day 1 English Language Arts

Vocabulary

Learn new vocabulary words from the Vocabulary List at the back of this packet. Practice using these words in the activities below.

Activity 1: *Reading*

- Read the next chapter in the book of your choice and decide what you find *interesting* and what you determine to be *important*.

Fill out the following chart:

What is Important	What is Interesting

Activity 2: *Writing*

- Using the information you recorded in your What is Important and What is Interesting chart, write about why you think the author chose to include this information in the book.

The author of this book included a lot of important and interesting information in writing the book. I believe that some of the reasons he/she decided to include this information is because

_____. *Another reason for this may be that the author wanted the readers to* _____

_____. *Finally, I also feel that the author wanted the readers to understand* **[give another reason that you did not mention before]** _____.

Day 1 Math

Vocabulary

Learn the new math vocabulary words below. You will use these vocabulary words in the activities today.

- **Variables:** A quantity that varies, or changes.
- **Algebraic Expression:** A rule written with numbers and symbols.

- **Evaluate :** To determine the value

Activity 1: *Variables and Expressions*

Please complete the following worksheet. Choose at least 15 exercises to solve. Solve both Applications (#34, 35). Be sure to show all of your work.

- Skill 1: Variables and Expressions

If you need Spanish activities for the concept of equations**,** please follow the steps below.

1. Go to tutorial site: http://destination.nycenet.edu
2. Login with the following user ID and PW:
   i. User: studentnyc
   ii. Password: student
3. Click on the Exploration Icon to access the tutorial
4. Scroll down to Mastering Skills & Concepts: Course V: Pre-Algebra – Spanish
5. Select the skill/concept to review:
   i. Activity 1: 1.4.1 - Writing Equations

Notebook Activity

In a notebook, describe how you would prove that your answer to question 34 is correct. Describe your steps.

Additional Activity: *Integers*

Do you have more time? Complete the following activity:

- Skill 20: Integers

SKILL 1

Name _____ Date _____

Variables and Expressions

Algebra is a language of symbols. In algebra, letters, called **variables**, are used to represent unknown quantities. A combination of one or more variables, numbers, and at least one operation is called an **algebraic expression**.

$x - 9$ means x minus 9.

$7m$ means 7 times m.

ab means a times b.

$\frac{h}{4}$ means h divided by 4.

To **evaluate** an algebraic expression, replace the variable or variables with known values and then use the order of operations.

EXAMPLE *Evaluate $2c - 7 + d$ if $c = 8$ and $d = 5$.*

$2c - 7 + d = 2(8) - 7 + 5$	*Replace c with 8 and d with 5.*
$= 16 - 7 + 5$	*Multiply.*
$= 9 - 5$	*Subtract.*
$= 14$	*Add.*

EXERCISES *Evaluate each expression if $x = 9$, $y = 5$, and $z = 2$.*

1. $x + 6$
2. $y - 3$
3. $z + 11$
4. $23 - x$
5. $6z$
6. $14 + y$
7. $4z + 5$
8. $24 - 2x$
9. $3y - 7$
10. $\frac{x}{3}$
11. $\frac{14}{z}$
12. $\frac{xy}{15}$

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13. $4x - 2y$

14. $6z - x$

15. $18 - 2x$

16. $6y - (x + z)$

17. $3x - z$

18. $5(y + 7)$

19. $2x + y - z$

20. $5z - y$

21. $4x - (z + 2y)$

22. $\frac{2x + 3z}{12}$

23. $\frac{7z - Y}{x}$

24. $\frac{5y - 7}{x}$

25. $(11 - 3z) + x + y$

26. $7(x - z)$

27. $6y - 9z$

28. $\frac{xy}{3} - z$

29. $\frac{40}{y} + x$

30. $\frac{4(x - y)}{z}$

31. $3x - 2(y - z)$

32. $(14 - 6z) + x$

33. $10z - (x + y)$

APPLICATIONS

34. The weekly production costs at Jessica's T-Shirt Shack are given by the algebraic expression $75 + 7s + 12t$ where s represents the number of short-sleeve shirts produced during the week and t represents the number of long-sleeve shirts produced during the week. Find the production cost for a week in which 30 short-sleeve and 24 long-sleeve shirts were produced.

35. The perimeter of a rectangle can be found by using the formula $2l + 2w$, where l represents the length of the rectangle and w represents the width of the rectangle. Find the perimeter of a rectangular swimming pool whose length is 32 feet and whose width is 20 feet.

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SKILL 20

Name _____ Date _____

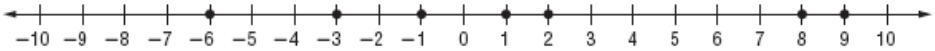
Integers

Numbers greater than zero are called **positive numbers**. Numbers less than zero are called **negative numbers**. The set of numbers that includes positive and negative numbers, and zero are called **integers**.

EXAMPLE

Emily recorded the temperature at noon for a week. The temperatures she recorded were 9°F, 8°F, −6°F, −3°F, −1°F, 2°F, and 1°F. What was the lowest and highest temperature recorded?

To answer the question, locate the temperatures on a number line.



On a number line, values increase as you move to the right.

Since −6 is furthest to the left, −6°F is the coldest temperature. 9 is the farthest number to the right, so 9°F is the highest temperature.

The **absolute value** of a number is the positive number of units a number is from zero on a number line.

EXAMPLE

Refer to the table. Which city's population changed the most?

Population Change, 1990–2000	
Atlanta, GA	+22,457
Baltimore, MD	−84,860
Columbus, OH	+78,560
Detroit, MI	−76,704
Indianapolis, IN	+49,974
Philadelphia, PA	−68,027

Find the absolute value of each number.

$|+22{,}457| = 22{,}457$
$|-84{,}860| = 84{,}860$
$|+78{,}560| = 78{,}560$
$|-76{,}704| = 76{,}704$
$|+49{,}974| = 49{,}974$
$|-68{,}027| = 68{,}027$

Since the absolute value of −84,860 is the greatest, Baltimore, Maryland, had the greatest population change.

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EXERCISES *Fill in each blank with <, >, or = to make a true sentence.*

1. 5 ____ −5
2. −4 ____ 3
3. 0 ____ −2
4. −6 ____ −12
5. −35 ____ −16
6. 19 ____ −22
7. 34 ____ 21
8. 23 ____ 23
9. −45 ____ −52

Write each set of integers in order from least to greatest.

10. {45, −23, 55, 0, −12, −37}
11. {56, −22, 34, −34, 12, −12}
12. {−450, −100, 254, 564, −356}
13. {1,276, −3,456, −943, −237, −467}

Find the absolute value.

14. $|-3|$
15. $|-5|$
16. $|16|$
17. $|27|$
18. $|156|$
19. $|-359|$
20. $|-821|$
21. $|1,436|$

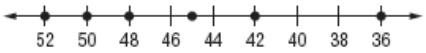
APPLICATIONS *Write an integer to describe each situation.*

22. Julio finished the race 3 seconds ahead of the second place finisher.
23. Matthew ended his round of golf 4 under par.
24. Denver is called the Mile High City because its elevation is 5,280 feet above sea level.

For Exercises 25–27, refer to the table.

Record Low Temperatures	
California	−45°F
Illinois	−36°F
Maine	−48°F
Nevada	−50°F
New York	−52°F
Pennsylvania	−42°F
Washington	−48°F

25. Use a number line to order the temperatures from least to greatest.



26. The record low temperature for Michigan is −51°F. Which states have higher record low temperatures?

27. Indiana's record low temperature is −36°F. Which states in the table have lower record low temperatures?

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Day 1 Science

Complete Activity 1 or 2 below:

Activity 1: *Earthquake Shakes Japan*

- Read the article below and answer the questions that follow.
- Para Espanol, prime aquí: http://schools.nyc.gov/Documents/teachandlearn/LearnatHome/ELL/7day1sp.pdf

Vocabulary
Learn the new vocabulary words below. You will use these vocabulary words in today's activity.

- **colleague** (*noun*): a coworker
- **havoc** (*noun*): destruction
- **magnitude** (*noun*): a measure of the amount of energy released by an earthquake, as indicated on the Richter scale
- **Richter scale** (*noun):* a scale from one to 10 used to measure how strong an earthquake is
- **tectonic plates** (*noun*): pieces of the earth's crust that move against one another

Earthquake Shakes Japan

WAJIMA, Japan (Achieve3000, March 27, 2007). A powerful earthquake shook coastal central Japan on Sunday, March 25. The disaster killed at least one person and caused major damage.

The earthquake, which measured 6.9 on the Richter scale, struck off the north coast of the Sea of Japan. Television footage taken during the quake showed buildings shaking violently for about 30 seconds. Footage captured afterwards showed collapsed buildings and shops with shattered windows. The footage also revealed streets littered with roof tiles and roads with cracked pavement.

"We felt violent shaking. My [coworkers] say the insides of their houses are a mess, with everything smashed on the floor," said Wataru Matsumoto, deputy mayor of the town of Anamizu, which was near the epicenter of the quake.

The quake brought destruction to the affected area. It knocked down at least 68 homes and left another 164 partially destroyed. The violent shaking triggered landslides, cut power, and interfered with phone service. It also broke underground water pipes and halted public transportation.

Even after the quake was over, its effects continued. Japan's Meteorological Agency issued a warning about possible tsunamis and stated that aftershocks could continue for a week. Thirty-six minutes after the quake, a small tsunami hit the shore, and officials removed the tsunami warning. Several aftershocks, two of them measuring 5.3 and 4.8 on the Richter scale, shook the area.

"A fairly big aftershock hit just minutes ago, and I jumped out the door," said Tomio Maeda, manager of a convenience store in Anamizu. "It's scary; I guess it's not over yet."

The quake killed at least one person and injured more than 200 others. The Fire and Disaster Management Agency reported that most of the injuries and damage were concentrated in the city of Wajima, which is about

193 miles northwest of Tokyo. That area is not considered prone to earthquakes; its last major earthquake took place in 1933.

Speaking to a parliamentary upper house committee on the day after the disaster, Japanese Prime Minister Shinzo Abe described the damage in detail. He then promised his support for the victims.

"The government will make every effort to help the victims of the earthquake so they can [go back to their] normal lives," the prime minister said.

One day after the earthquake, officials declared that Japan's new earthquake early alert system was a success. The system is designed to issue early warnings of possible tsunamis. It is more sensitive than the one it replaced and can detect slight underground shaking that happens before a major quake occurs. This allows officials to warn people to get to high ground before a possible tsunami hits the shoreline.

"Before the new system went into effect, it took about three minutes to get out a tsunami alert. On Sunday, we were able to get the alert out within a minute, so I'd say it was a success," said Meteorological Agency official Yosuke Igarashi.

Japanese officials are constantly working on improvements to Japan's earthquake warning system, and for good reason. Japan sits on four tectonic plates, making it one of the world's most earthquake-prone countries. In the last few years, Japan has experienced several major quakes. In October 2004, an earthquake measuring 6.8 on the Richter scale hit northern Japan, killing 40 people and damaging more than 6,000 homes. It was the deadliest quake to hit Japan since 1995. That year, a quake measuring 7.2 killed 6,433 people in Kobe, in western Japan. Experts say that Tokyo, the nation's capital, has a 90-percent chance of suffering a major quake in the next 50 years.

The Associated Press contributed to this story.

Instructions:
Select the correct answer.

Question 1:
What is today's article mainly about?
1. A recent tsunami in Japan and its effects
2. Damage to stores from a tsunami in Japan
3. A recent earthquake in Japan and its effects
4. Damage to roads from an earthquake in Japan

Question 2:
Which information is **not** in the article?
1. How Tokyo residents prepare their homes for a major earthquake
2. What Japanese officials think about the country's early warning system
3. How likely it is that a major earthquake will hit Tokyo within 50 years
4. What kind of damage occurred from a recent earthquake and its aftershocks

Day 1 Science (continued)

Question 3:
Why does the author point out that the last major earthquake in Wajima took place in 1933?
1. To show that people there are not afraid of earthquakes
2. To show that the city does not have a warning system in place
3. To show that people there do not know anything about earthquakes
4. To show that the city does not experience many strong earthquakes

Question 4:
The reader can tell from the article that Japanese officials _____.
1. Expect earthquakes to occur and try to be prepared for them
2. Are not creating a warning systems fast enough to keep people safe
3. Expect large tsunamis to occur because they happen nearly every day
4. Are not worried about the effects of large earthquakes or possible tsunamis

Question 5:
After which paragraph would the author place a quote from a resident of Wajima who was surprised by the strong earthquake?
1. After paragraph 3
2. After paragraph 5
3. After paragraph 7
4. After paragraph 11

Question 6:
Which statement best summarizes the *last* paragraph?
1. Japan has had a few small earthquakes.
2. Officials in Japan have a lot of work to do in cleaning up the damage.
3. Japan is very prone to large earthquakes.
4. Officials in Japan are unhappy with the earthquake and tsunami warning system.

Question 7:
Which is the closest antonym for the word *prone*?
1. Restless
2. Unlikely
3. Primitive
4. Spectacular

Question 8:
Another name for a *tsunami* is a(n)_____.
1. Ocean
2. Current
3. Whirlpool
4. Tidal wave

Day 1 Science (continued)

Additional Question

Your state plans to send aid to assist people affected by the earthquake in Japan. What do people need? Make a list in order of importance. Explain why you placed the aid in this order.

Use details from the article, as well as your own ideas, in your response.

Write your answer below.

Day 1 Science (continued)

Activity 2: *Science Inquiry Project – Geology: The History of Seismographs*

The following activity is Day 1 of a four day project

Vocabulary
Learn the new vocabulary words below. You will use these vocabulary words in today's activity.

- **Earthquake**: A sudden movement of the Earths Crust.
- **Stress**: A force that tends to distort or deform something by compressing or stretching it.
- **Seismograph**: An instrument that detects and records vibrations and movement in the Earth, especially during an earthquake.

The earthquakes occurring in New Madrid, Missouri, in 1811 and 1812, San Francisco, California, in 1906, and Prince William Sound, Alaska, in 1964, three major natural disasters in United States history, cost millions of dollars in property damage, and countless lives lost. The first earthquake ever recorded occurred in China in 1177 B.C. Europeans began describing their earthquakes in detailed writings in the 1500s. Although earthquakes are mentioned in written records as early as 580 B.C., these narrative reports were subject to exaggeration and bias. In more modern times, cameras, television, and computers have increased the quantitative observations and record-keeping abilities of scientists.

With the advancements of science and technology, how do earth scientists measure earthquakes? Using highly technical instruments, they measure direction, pressure, stress levels, energy build up and release, and movement. They are able to closely monitor earthquake data. One of their most valuable instruments is the seismograph.

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Directions: Below is a sample schedule of how you might complete this assignment over the four days.

- **Day 1: Research the history of seismographs from early Chinese cultures to the present day technological design. Use** www.crustal.ucsb.edu/ics/understanding/ and the handouts that follow.
- Day 2: Identify problems past scientists have confronted when attempting to measure earthquake location and intensity.
- Day 3: Design a simple seismograph that will track a simulated earthquake and complete a set of blueprints.
- Day 4: Then write and "produce" a 3-5 minute informative commercial for your home seismograph.

Suggested Additional Resources:

- www.crustal.ucsb.edu/ics/understanding/ - Complete the quiz, and read of famous Earthquake accounts
- http://pubs.usgs.gov/gip/earthq1/ - Measure earthquakes, research how earthquakes happen, examine "science fair project" and read how to build a seismometer.

Source: This activity is from Glencoe NY Science, Grade 7, Unit 1: Geology
http://glencoe.mcgraw-hill.com/sites/0078778646/student_view0/unit1/unit_project_3.html

Mark Twain and the October 8, 1865, San Francisco Earthquake

After a brief stint as a Confederate soldier, Mark Twain headed west with his Unionist brother to see the Wild West. His experiences are captured in the book, *Roughing It*, one of Twain's earlier works. In the fall of 1865, while in the city of San Francisco, Twain experienced his first earthquake.

> It was just after noon, on a bright October day. I was coming down Third Street. The only objects in motion anywhere in sight in that thickly built and populous quarter were a man in a buggy behind me, and a streetcar wending slowly up the cross street. Otherwise, all was solitude and a Sabbath stillness.
>
> As I turned the corner, around a frame house, there was a great rattle and jar, and it occurred to me that here was an item!--no doubt a fight in that house. Before I could turn and seek the door, there came a terrific shock; the ground seemed to roll under me in waves, interrupted by a violent joggling up and down, and there was a heavy grinding noise as of brick houses rubbing together. I fell up against the frame house and hurt my elbow. I knew what it was now... a third and still severer shock came, and as I reeled about on the pavement trying to keep my footing, I saw a sight! The entire front of a tall four-story brick building on Third Street sprung outward like a door and fell sprawling across the street, raising a great dust-like volume of smoke!
>
> And here came the buggy--overboard went the man, and in less time than I can tell it the vehicle was distributed in small fragments along three hundred yards of street. ... The streetcar had stopped, the horses were rearing and plunging, the passengers were pouring out at both ends, and one fat man had crashed halfway through a glass window on one side of the car, got wedged fast, and was squirming and screaming like an impaled madman. Every door, of every house, as far as the eye could reach, was vomiting a stream of human beings; and almost before one could execute a wink and begin another, there was a massed multitude of people stretching in endless procession down every street my position commanded. Never was a solemn solitude turned into teeming life quicker.

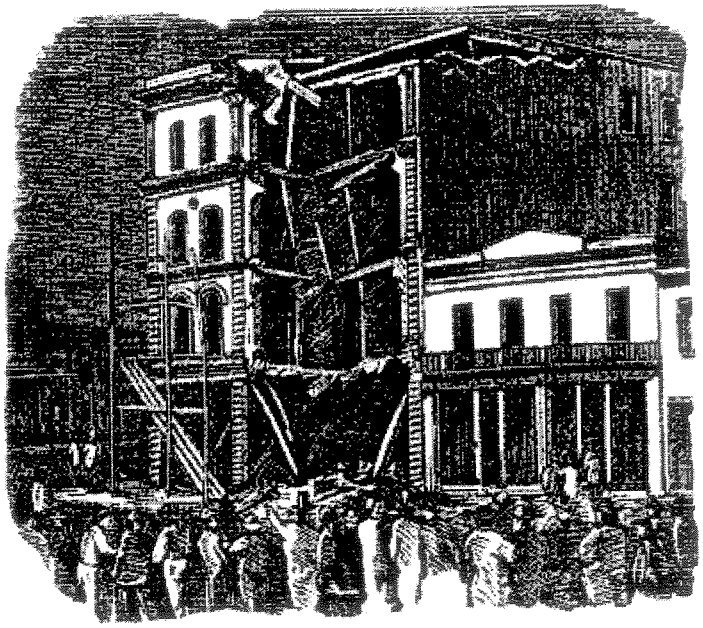


Image courtesy of The Museum of the City of San Francisco.

This image shows a four-story brick building on the corner of Third and Mission streets in San Francisco following the 1865 earthquake. It appeared in *The Daily Alta California*, and is probably the very same building Twain describes as "sprung outward like a door" in the above quote.

Forty-one years after Twain experienced this earthquake, in 1906, a truly great earthquake struck San Francisco, starting a fire that burned most of the city. Another famous American novelist, Jack London, was there to record the events of the fire.

Home Page Jack London

A Brief History of Seismology to 1910: Page 1 of 3

Would you believe that giant snakes, turtles, catfish, or spiders live underneath the ground, and it is their movements that create earthquakes? Maybe you wouldn't, but your ancestors did. Ancient peoples had many fanciful explanations for earthquakes, usually involving something large and restless living beneath the earth's surface.

Aristotle was one of the first to attempt an explanation of earthquakes based on natural phenomena. He postulated that winds within the earth whipped up the occasional shaking of the earth's surface.

Empirical observations of the effects of earthquakes were rare, however, until 1750, when England was uncharacteristically rocked by a series of five strong earthquakes. These earthquakes were followed on Sunday, November 1, 1755, by a cataclysmic shock and tsunami that killed an estimated 70,000 people, leveling the city of Lisbon, Portugal, while many of its residents were in church. This event marks the beginning of the modern era of seismology, prompting numerous studies into the effects, locations, and timing of earthquakes.

Prior to the Lisbon earthquake, scholars had looked almost exclusively to Aristotle, Pliny, and other ancient classical sources for explanations of earthquakes. Following the Lisbon earthquake, this attitude was jettisoned for one that stressed ideas based on modern observations. Cataloging of the times and locations of earthquakes and studying the physical effects of earthquakes began in earnest, led by such people as John Michell in England and Elie Bertrand in Switzerland.

The hundred or so years following the Lisbon earthquake saw sporadic but increasing studies of earthquake phenomena. These efforts were often spurred on by earthquake catastrophes, such as the 1783 Calabrian earthquakes that killed 35,000 people in the southern toe of Italy.

Home Page Next Page

A Brief History of Seismology to 1910: Page 2 of 3

As communication between various parts of the world became more common, earthquake observations from throughout the world could be combined. Following an earthquake in Chile in 1822, the author Maria Graham reported systematic changes in the elevation of the Chilean coastline. Observations of coastline changes were confirmed following the 1835 Chilean earthquake by Robert FitzRoy, captain of the H.M.S. *Beagle*, while Charles Darwin was onshore examining the geology of the Andes.

In the 1850s, 60s, and 70s, three European contemporaries made cornerstone efforts in seismology. Robert Mallet, an engineer born in Dublin who designed many of London's bridges, measured the velocity of seismic waves in the earth using explosions of gunpowder. His idea was to look for variations in seismic velocity that would indicate variations in the properties of the earth. This same method is still used today, for example in oil field exploration. Robert Mallet was also one of the first to estimate the depth of an earthquake underground.

At the same time as Mallet was setting off explosions of gunpowder in England, Alexis Perrey, in France, was making quantitative analyses of catalogs of earthquakes. He was looking for periodic variations of earthquakes with the seasons and with lunar phases. And in Italy, Luigi Palmieri invented an electromagnetic seismograph, one of which was installed near Mount Vesuvius and another at the University of Naples. These seismographs were the first seismic instruments capable of routinely detecting earthquakes imperceptible to human beings.

The foregoing work set the stage for the late 1800s and early 1900s, when many fundamental advances in seismology would be made. In Japan, three English professors, John Milne, James Ewing, and Thomas Gray, working at the Imperial College of Tokyo, invented the first seismic instruments sensitive enough to be used in the scientific study of earthquakes.

Home Page Previous Page Next Page

A Brief History of Seismology to 1910: Page 3 of 3

In the United States, Grove Karl Gilbert, after studying the fault scarp from the 1872 Owens Valley, California earthquake, concluded that the faults were a primary feature of earthquakes, not a secondary one. Until his time, most people thought that earthquakes were the result of underground explosions and that faults were only a result of the explosion, not a primary feature of earthquakes.

Also in the United States, Harry Fielding Reid took Gilbert's work one step further. After examining the fault trace of the 1906 San Francisco earthquake, Reid deduced that earthquakes were the result of the gradual buildup of stresses within the earth occurring over many years. This stress is due to distant forces and is eventually released violently during an earthquake, allowing the earth to rapidly rebound after years of accumulated strain.

The late 1800s and early 1900s also saw scientific inquiry into earthquakes begun by Japanese researchers. Seikei Sekiya became the first person to be named a professor in seismology; he was also one of the first people to quantitatively analyse seismic recordings from earthquakes. Another famous Japanese researcher from that time is Fusakichi Omori, who, among other work, studied the rate of decay of aftershock activity following large earthquakes. His equations are still in use today.

The twentieth century has seen an increased interest in the scientific study of earthquakes, too involved to discuss here. It should be noted, however, that research into earthquakes has broadened and contributions now come from numerous areas affected by earthquakes, including Japan, the United States, Europe, Russia, Canada, Mexico, China, Central and South America, New Zealand, and Australia, among others.

Source:

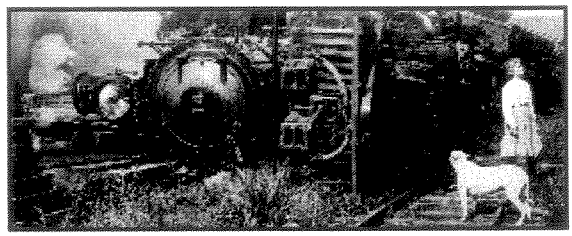
This account is loosely based on *The Founders of Seismology*, by Charles Davison, Arno Press, New York, 1978.

Home Page Previous Page

USGS

Introduction

One of the most frightening and destructive phenomena of nature is a severe earthquake and its terrible aftereffects. An earthquake is a sudden movement of the Earth, caused by the abrupt release of strain that has accumulated over a long time. For hundreds of millions of years, the forces of plate tectonics have shaped the Earth as the huge plates that form the Earth's surface slowly move over, under, and past each other. Sometimes the movement is gradual. At other times, the plates are locked together, unable to release the accumulating energy. When the accumulated energy grows strong enough, the plates break free. If the earthquake occurs in a populated area, it may cause many deaths and injuries and extensive property damage.



Full size image - 155k

Today we are challenging the assumption that earthquakes must present an uncontrollable and unpredictable hazard to life and property. Scientists have begun to estimate the locations and likelihoods of future damaging earthquakes. Sites of greatest hazard are being identified, and definite progress is being made in designing structures that will withstand the effects of earthquakes.

Many buildings in Charleston, South Carolina, were damaged or destroyed by the large earthquake that occured August 31, 1886. - 87k

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Earthquakes in History

A dramatic picture of horses killed by a collapsed building wall in the 1906 San Francisco earthquake

The scientific study of earthquakes is comparatively new. Until the 18th century, few factual descriptions of earthquakes were recorded, and the natural cause of earthquakes was little understood. Those who did look for natural causes often reached conclusions that seem fanciful today; one popular theory was that earthquakes were caused by air rushing out of caverns deep in the Earth's interior.

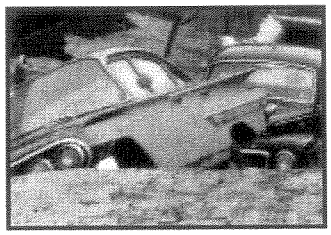
The earliest earthquake for which we have descriptive information occurred in China in 1177 B.C. The Chinese earthquake catalog describes several dozen large earthquakes in China during the next few thousand years. Earthquakes in Europe are mentioned as early as 580 B.C., but the earliest for which we have some descriptive information occurred in the mid-16th century. The earliest known earthquakes in the Americas were in Mexico in the late 14th century and in Peru in 1471, but descriptions of the effects were not well documented. By the 17th century, descriptions of the effects of earthquakes were being published around the world - although these accounts were often exaggerated or distorted.

The most widely felt earthquakes in the recorded history of North America were a series that occurred in 1811-1812 near New Madrid, Missouri. A great earthquake, whose magnitude is estimated to be about 8, occurred on the morning of December 16, 1811. Another great earthquake occurred on January 23, 1812, and a third, the strongest yet, on February 7, 1812. Aftershocks were nearly continuous between these great earthquakes and continued for months afterwards. These earthquakes were felt by people as far away as Boston and Denver. Because the most intense effects were in a sparsely populated region, the destruction of human life and property was slight. If just one of these enormous earthquakes occurred in the same area today, millions of people and buildings and other structures worth billions of dollars would be affected.

The San Francisco earthquakes of 1906 was one of the most destructive in the recorded history of North America - the earthquake and the fire that followed killed nearly 700 people and left the city in ruins.

The great 1906 San Francisco earthquake and fire destroyed most of the city and left 250,00 people homeless. Full size image - 151k.

The Alaska earthquake of March 27, 1964, was of greater magnitude than the San Francisco earthquake; it released perhaps twice as much energy and was felt over an area of almost 500,000 square miles.



Anchorage, Alaska, 1964 - 167k

The ground motion near the epicenter was so violent that the tops of some trees were snapped off. One hundred and fourteen people (some as far away as California) died as a result of this earthquake, but loss of life and property would have been far greated had Alaska been more densely populated.

Geologic Information -- Education and Outreach

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Where Earthquakes Occur

The Earth is formed of several layers that have very different physical and chemical properties. The outer layer, which averages about 70 kilometers in thickness, consists of about a dozen large, irregularly shaped plates that slide over, under and past each other on top of the partly molten inner layer. Most earthquakes occur at the boundaries where the plates meet. In fact, the locations of earthquakes and the kinds of ruptures they produce help scientists define the plate boundaries.

There are three types of plate boundaries: spreading zones, transform faults, and subduction zones. At *spreading zones*, molten rock rises, pushing two plates apart and adding new material at their edges. Most spreading zones are found in oceans; for example, the North American and Eurasian plates are spreading apart along the mid-Atlantic ridge. Spreading zones usually have earthquakes at shallow depths (within 30 kilometers of the surface).

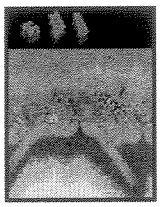

Illustration of Plate Boundary Types - 95k

Transform faults are found where plates slide past one another. An example of a transform-fault plate boundary is the San Andreas fault, along the coast of California and northwestern Mexico. Earthquakes at transform faults tend to occur at shallow depths and form fairly straight linear patterns.

Subduction zones are found where one plate overrides, or subducts, another, pushing it downward into the mantle where it melts. An example of a subduction-zone plate boundary is found along the northwest coast of the United States, western Canada, and southern Alaska and the Aleutian Islands. Subduction zones are characterized by deep-ocean trenches, shallow to deep earthquakes, and mountain ranges containing active volcanoes.

Map of the Tectonic Plates - 67k

Earthquakes can also occur within plates, although plate-boundary earthquakes are much more common. Less than 10 percent of all earthquakes occur within plate interiors. As plates continue to move and plate boundaries change over geologic time, weakened boundary regions become part of the interiors of the plates. These zones of weakness within the continents can cause earthquakes in response to stresses that originate at the edges of the plate or in the deeper crust. The New Madrid earthquakes of 1811-1812 and the 1886 Charleston earthquake

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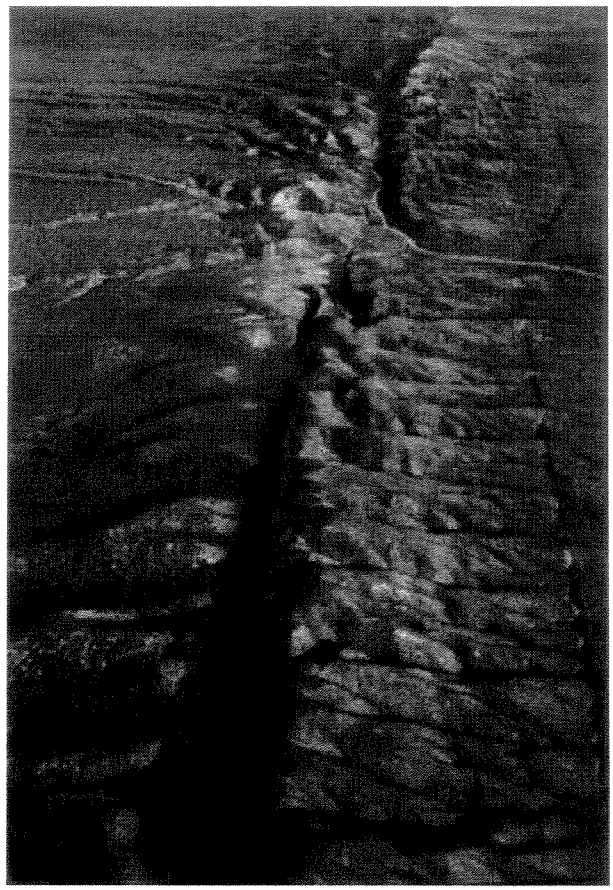
How Earthquakes Happen



An aerial view of the San Andreas fault in the Carrizo Plain, Central California.

An earthquake is the vibration, sometimes violent, of the Earth's surface that follows a release of energy in the Earth's crust. This energy can be generated by a sudden dislocation of segments of the crust, by a volcanic eruption, or event by manmade explosions. Most destructive quakes, however, are caused by dislocations of the crust. The crust may first bend and then, when the stress exceeds the strength of the rocks, break and "snap" to a new position. In the process of breaking, vibrations called "seismic waves" are generated. These waves travel outward from the source of the earthquake along the surface and through the Earth at varying speeds depending on the material through which they move. Some of the vibrations are of high enough frequency to be audible, while others are of very low frequency. These vibrations cause the entire planet to quiver or ring like a bell or tuning fork.

A *fault* is a fracture in the Earth's crust along which two blocks of the crust have slipped with respect to each other. Faults are divided into three main groups, depending on how they move. *Normal faults* occur in response to pulling or tension; the overlying block moves down the dip of the fault plane. *Thrust (reverse) faults* occur in response to squeezing or compression; the overlying block moves up the dip of the fault plane. *Strike-slip (lateral) faults* occur in response to either type of stress; the blocks move horizontally past one another. Most

faulting along spreading zones is normal, along subduction zones is thrust, and along transform faults is strike-slip.

Geologists have found that earthquakes tend to reoccur along faults, which reflect zones of weakness in the Earth's crust. Even if a fault zone has recently experienced an earthquake, however, there is no guarantee that all the stress has been relieved. Another earthquake could still occur. In New Madrid, a great earthquake was followed by a large aftershock within 6 hours on December 6, 1811. Furthermore, relieving stress along one part of the fault may increase stress in another part; the New Madrid earthquakes in January and February 1812 may have resulted from this phenomenon.

The *focal depth* of an earthquake is the depth from the Earth's surface to the region where an earthquake's energy originates (the *focus*). Earthquakes with focal depths from the surface to about 70 kilometers (43.5 miles) are classified as shallow. Earthquakes with focal depths from 70 to 300 kilometers (43.5 to 186 miles) are classified as intermediate. The focus of deep earthquakes may reach depths of more than 700 kilometers (435 miles). The focuses of most earthquakes are concentrated in the crust and upper mantle. The depth to the center of the Earth's core is about 6,370 kilometers (3,960 miles), so event the deepest earthquakes originate in relatively shallow parts of the Earth's interior.

The *epicenter* of an earthquake is the point on the Earth's surface directly above the focus. The location of an earthquake is commonly described by the geographic position of its epicenter and by its focal depth.

Earthquakes beneath the ocean floor sometimes generate immense sea waves or tsunamis (Japan's dread "huge wave"). These waves travel across the ocean at speeds as great as 960 kilometers per hour (597 miles per hour) and may be 15 meters (49 feet) high or higher by the time they reach the shore. During the 1964 Alaskan earthquake, tsunamis engulfing coastal areas caused most of the destruction at Kodiak, Cordova, and Seward and caused severe damage along the west coast of North America, particularly at Crescent City, California. Some waves raced across the ocean to the coasts of Japan.

Liquefaction, which happens when loosely packed, water-logged sediments lose their strength in response to strong shaking, causes major damage during earthquakes. During the 1989 Loma Prieta earthquake, liquefaction of the soils and debris used to fill in a lagoon caused major subsidence, fracturing, and horizontal sliding of the ground surface in the Marina district in San Francisco.

Landslides triggered by earthquakes often cause more destruction than the earthquakes themselves. During the 1964 Alaska quake, shock-induced landslides devastated the Turnagain Heights residential development and many downtown areas in Anchorage. An observer gave a vivid report of the breakup of the unstable earth materials in the Turnagain Heights region: *I got out of my car, ran northward toward my driveway, and then saw that the bluff had broken back approximately 300 feet southward from its original edge. Additional slumping of the bluff caused me to return to my car and back southward approximately 180 feet to the corner of McCollie and Turnagain Parkway. The bluff slowly broke until the corner of Turnagain Parkway and McCollie had slumped northward.*

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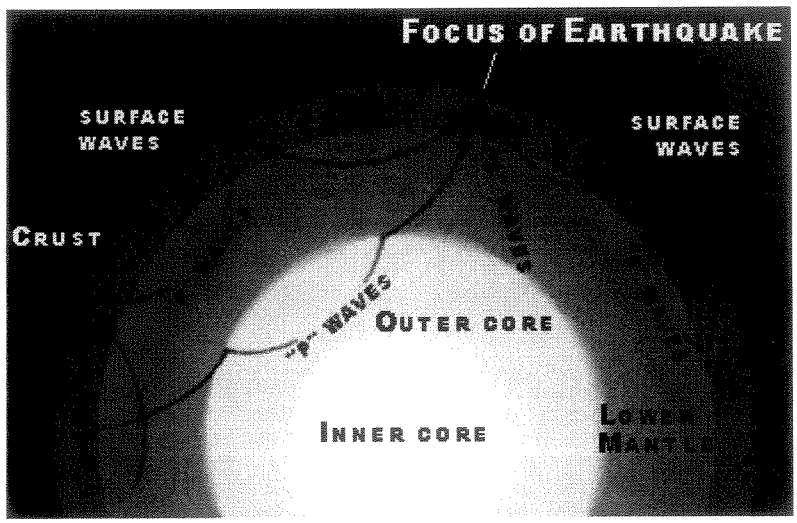
Measuring Earthquakes

The vibrations produced by earthquakes are detected, recorded, and measured by instruments call seismographs. The zig-zag line made by a seismograph, called a "seismogram," reflects the changing intensity of the vibrations by responding to the motion of the ground surface beneath the instrument. From the data expressed in seismograms, scientists can determine the time, the epicenter, the focal depth, and the type of faulting of an earthquake and can estimate how much energy was released.



The two general types of vibrations produced by earthquakes are *surface waves*, which travel along the Earth's surface, and *body waves*, which travel through the Earth. Surface waves usually have the strongest vibrations and probably cause most of the damage done by earthquakes.

Body waves are of two types, *compressional* and *shear*. Both types pass through the Earth's interior from the focus of an earthquake to distant points on the surface, but only compressional waves travel through the Earth's molten core. Because compressional waves travel at great speeds and ordinarily reach the surface first, they are often called "primary waves" or simply "P" waves. P waves push tiny particles of Earth material directly ahead of them or displace the particles directly behind their line of travel.

Shear waves do not travel as rapidly through the Earth's crust and mantle as do compressional waves, and because they ordinarily reach the surface later, they are called "secondary" or "S" waves. Instead of affecting material directly behind or ahead of their line of travel, shear waves displace material at right angles to their path and therefore sometimes called "transverse" waves.

The first indication of an earthquake is often a sharp thud, signaling the arrival of compressional waves. This is followed by the shear waves and then the "ground roll" caused by the surface waves. A geologist who was at Valdez, Alaska, during the 1964 earthquake described this sequence: *The first tremors were hard enough to stop a moving person, and shock waves were immediately noticeable on the surface of the ground. These shock waves continued with a rather long frequency, which gave the observer an impression of a rolling feeling rather than abrupt hard jolts. After about 1 minute the amplitude or strength of the shock waves increased in intensity*

and failures in buildings as well as the frozen ground surface began to occur ... After about 3 1/2 minutes the severe shock waves ended and people began to react as could be expected.

The severity of an earthquake can be expressed in several ways. The *magnitude* of an earthquake, usually expressed by the *Richter Scale*, is a measure of the amplitude of the seismic waves. The *moment magnitude* of an earthquake is a measure of the amount of energy released - an amount that can be estimated from seismograph readings. The *intensity*, as expressed by the *Modified Mercalli Scale*, is a subjective measure that describes how strong a shock was felt at a particular location.

The Richter Scale, named after Dr. Charles F. Richter of the California Institute of Technology, is the best known scale for measuring the magnitude of earthquakes. The scale is logarithmic so that a recording of 7, for example, indicates a disturbance with ground motion 10 times as large as a recording of 6. A quake of magnitude 2 is the smallest quake normally felt by people. Earthquakes with a Richter value of 6 or more are commonly considered major; great earthquakes have magnitude of 8 or more on the Richter scale.

The Modified Mercalli Scale expresses the intensity of an earthquake's effects in a given locality in values ranging from I to XII. The most commonly used adaptation covers the range of intensity from the condition of "I -- Not felt except by a very few under especially favorable conditions," to "XII -- Damage total. Lines of sight and level are distorted. Objects thrown upward into the air." Evaluation of earthquake intensity can be made only after eyewitness reports and results of field investigations are studied and interpreted. The maximum intensity experienced in the Alaska earthquake of 1964 was X; damage from the San Francisco and New Madrid earthquakes reached a maximum intensity of XI.

Earthquakes of large magnitude do not necessarily cause the most intense surface effects. The effect in a given region depends to a large degree on local surface and subsurface geologic conditions. An area underlain by unstable ground (sand, clay, or other unconsolidated materials), for example, is likely to experience much more noticeable effects than an area equally distant from an earthquake's epicenter but underlain by firm ground such as granite. In general, earthquakes east of the Rocky Mountains affect a much larger area than earthquakes west of the Rockies.

An earthquake's destructiveness depends on many factors. In addition to magnitude and the local geologic conditions, these factors include the focal depth, the distance from the epicenter, and the design of buildings and other structures. The extent of damage also depends on the density of population and construction in the area shaken by the quake.

The Loma Prieta earthquake of 1989 demonstrated a wide range of effects. The Santa Cruz mountains suffered little damage from the seismic waves, even though they were close to the epicenter. The central core of the city of Santa Cruz, about 24 kilometers (15 miles) away from the epicenter, was almost competely destroyed. More than 80 kilometers (50 miles) away, the cities of San Francisco and Oakland suffered selective but severe damage, including the loss of more than 40 lives. The greatest destruction occurred in areas where roads and elevated structures were built on stable ground underlain by loose, unconsolidated soils.

The Northridge, California, earthquake of 1994 also produced a wide variety of effects, even over distances of just a few hundred meters. Some buildings collapsed, while adjacent buildings of similar age and construction remained standing. Similarly, some highway spans collapsed, while others nearby did not.

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Volcanoes and Earthquakes

Earthquakes are associated with volcanic eruptions. Abrupt increases in earthquake activity heralded eruptions at Mount St. Helens, Washington; Mount Spurr and Redoubt Volcano, Alaska; and Kilauea and Mauna Loa, Hawaii.

A sudden increase in earthquake tremors signaled the beginning of eruptions at Redoubt Volcano in 1989-90.
Full Size Image - 228k

The location and movement of swarms of tremors indicate the movement of magma through the volcano. Continuous records of seismic and tiltmeter (a device that measures ground tilting) data are maintained at U.S. Geological Survey volcano observatories in Hawaii, Alaska, California, and the Cascades, where study of these records enables specialists to make short-range predictions of volcanic eruptions. These warnings have been especially effective in Alaska, where the imminent eruption of a volcano requires the rerouting of international air traffic to enable airplanes to avoid volcanic clouds. Since 1982, at least seven jumbo jets, carrying more than 1,500 passengers, have lost power in the air after flying into clouds of volcanic ash. Though all flights were able to restart their engines eventually and no lives were lost, the aircraft suffered damages of tens of millions of dollars. As a result of these close calls, an international team of volcanologists, meteorologists, dispatchers, pilots, and controllers have begun to work together to alert each other to imminent volcanic eruptions and to detect and track volcanic ash clouds.

Geologic Information -- Education and Inquiries

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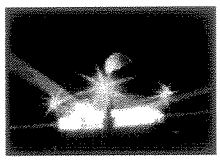
Predicting Earthquakes

The goal of earthquake prediction is to give warning of potentially damaging earthquakes early enough to allow appropriate response to the disaster, enabling people to minimize loss of life and property. The U.S. Geological Survey conducts and supports research on the likelihood of future earthquakes. This research includes field, laboratory, and theoretical investigations of earthquake mechanisms and fault zones. A primary goal of earthquake research is to increase the reliability of earthquake probability estimates. Ultimately, scientists would like to be able to specify a high probability for a specific earthquake on a particular fault within a particular year. Scientists estimate earthquake probabilities in two ways: by studying the history of large earthquakes in a specific area and the rate at which strain accumulates in the rock.



This time-exposure photograph of the electronic-laser, ground-motion movement system in operation at Parkfield, California, to track movement along the San Andreas fault. Full size image - 40 k

Scientists study the past frequency of large earthquakes in order to determine the future likelihood of similar large shocks. For example, if a region has experienced four magnitude 7 or larger earthquakes during 200 years of recorded history, and if these shocks occurred randomly in time, then scientists would assign a 50 percent probability (that is, just as likely to happen as not to happen) to the occurrence of another magnitude 7 or larger quake in the region during the next 50 years.

But in many places, the assumption of random occurrence with time may not be true, because when strain is released along one part of the fault system, it may actually increase on another part. Four magnitude 6.8 or larger earthquakes and many magnitude 6 - 6.5 shocks occurred in the San Francisco Bay region during the 75 years between 1836 and 1911. For the next 68 years (until 1979), no earthquakes of magnitude 6 or larger occurred in the region. Beginning with a magnitude 6.0 shock in 1979, the earthquake activity in the region increased dramatically; between 1979 and 1989, there were four magnitude 6 or greater earthquakes, including the magnitude 7.1 Loma Prieta earthquake. This clustering of earthquakes leads scientists to estimate that the probability of a magnitude 6.8 or larger earthquake occurring during the next 30 years in the San Francisco Bay region is about 67 percent (twice as likely as not).

Another way to estimate the likelihood of future earthquakes is to study how fast strain accumulates. When plate movements build the strain in rocks to a critical level, like pulling a rubber band too tight, the rocks will suddenly break and slip to a new position. Scientists measure how much strain accumulates along a fault segment each year, how much time has passed since the last earthquake along the segment, and how much strain was released in the last earthquake. This information is then used to calculate the time required for the accumulating strain to build to the level that results in an earthquake. This simple model is complicated by the fact that such detailed information about faults is rare. In the United States, only the San Andreas fault system has adequate records for using this prediction method.

Both of these methods, and a wide array of monitoring techniques, are being tested along part of the San Andres fault. For the past 150 years, earthquakes of about magnitude 6 have occurred an average of every 22 years on the San Andreas fault near Parkfield, California. The last shock was in 1966. Because of the consistency and similarity of these earthquakes, scientists have started an experiment to "capture" the next Parkfield earthquake. A dense web of monitoring instruments was deployed in the region during the late 1980s. The main goals of the ongoing Parkfield Earthquake Prediction Experiment are to record the geophysical signals before and after the expected earthquake; to issue a short-term prediction; and to develop effective methods of communication between earthquake scientists and community officials responsible for disaster response and mitigation. This project has already made important contributions to both earth science and public policy.

Scientific understanding of earthquakes is of vital importance to the Nation. As the population increases, expanding urban development and construction works encroach upon areas susceptible to earthquakes. With a greater understanding of the causes and effects of earthquakes, we may be able to reduce damage and loss of life from this destructive phenomenon.

Geologic Information -- Education and Outreach

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Day 2 Schedule

Subject	Minutes Per Day (At Least!)	Assignments	What Did I Learn Today?
English Language Arts	45	• Learn new vocabulary words from the Vocabulary List • Activity 1: Making Inferences • Activity 2: Writing	•
Math	45	• Skill 2: Writing Expressions and Equations	•
Science	45	Complete at least one of the following activities: • Activity 1: *Earthquake Shakes up Hawaii (English or Spanish)* • Activity2: Continue *Geology* activity through the study of Seismographs	•
Fitness and Health	30	• Exercise for 30 minutes. Choose from the Activity Calendars at the back of this booklet.	•
Arts	30	• Choose one or two activities from Visual Arts Activities at the back of the booklet	•
TV Shows and Websites	30	• Choose TV shows and websites to further your learning at home	•

Day 2 English Language Arts

Vocabulary

Learn new vocabulary words from the Vocabulary List at the back of this packet.

Activity 1: *Making Inferences*

- Continue reading a chapter in the book of your choice. Today you will try to figure out what the author means by practicing how to make inferences. Use the following chart to help you with this.

Something on the page	+	Something you know	=	A Good Inference

Activity 2: *Writing*

- Could you describe brushing your hair without using the words "hair" or "brush"? You might say you are grooming your long, shiny tresses!

- Choose one of the tasks below and write a one-page description without using any of the words listed after the task. Use your powers of imagination - and a thesaurus - to help you on your way.

1. "roasting a hot dog" roast, hot dog, fire, stick

2. "eating a piece of birthday cake" birthday cake, fork

3. "playing fetch with a dog" dog, run, fetch, play

4. "sailing" boat, sail, water

5. "watching television" watch, television, T.V., look

Given each one of the words below, write as many single, descriptive words as you can about the noun.

rabbit

_____

tree

_____

Day 2 English Language Arts (continued)

flower

_____

bird

_____

summer

_____

winter

_____

Day 2 Math

Vocabulary

Learn the new math vocabulary words below. You will use these vocabulary words in the activities today.

- **Algebraic Equation**: A mathematical sentence stating that two quantities have the same value. An equal sign, =, is used to separate the two quantities.

Activity 1: *Writing Expressions and Equations*

Please complete the following assignment. Solve exercises 1 to 10. Solve at least 2 Applications problems (#11, 12, 13). Be sure to show all of your work.

- Skill 2: Writing Expressions and Equations

If you need Spanish activities to review the concept of equations**,** please follow the steps below.

- Step 1: Go to tutorial site: http://destination.nycenet.edu
- Step 2: Login with the following user ID and PW:
  - User: studentnyc
  - Password: student
- Step 3: Click on the Exploration Icon to access the tutorial
- Step 4: Scroll down to Mastering Skills & Concepts: Course V: Pre-Algebra – Spanish
- Step 5: Select the skill/concept to review.
  - Activity 2: 1.4.2 - Simplifying Both Sides of an Equation

Notebook Activity

After completing #7 and #8, answer the following question:
Is there more than one way your answer could have been written?

Additional Activity: *Adding and Subtracting Integers*

Do you have more time? Complete the following activity:

- Skill 21: Adding and Subtracting Integers

SKILL 2

Name _____ Date _____

Writing Expressions and Equations

Translating verbal phrases and sentences into algebraic expressions and equations is an important skill in algebra. Key words and phrases play an essential role in this skill.

The first step in translating a verbal phrase into an algebraic expression or a verbal sentence into an algebraic equation is to choose a variable and a quantity for the variable to represent. This is called **defining a variable**.

The following table lists some words and phrases that suggest addition, subtraction, multiplication, and division. Once a variable is defined, these words and phrases will be helpful in writing the complete expression or equation.

Addition	Subtraction	Multiplication	Division
plus	minus	times	divided
sum	difference	product	quotient
more than	less than	multiplied	per
increased by	subtract	each	rate
in all	decreased by	of	ratio
together	less	factors	separate

EXAMPLES

Translate the phrase "three times the number of students per class" into an algebraic expression.

Words three times the number of students per class

Variable Let s represent the number of students per class.

Expression $3s$

Translate the sentence "The weight of the apple increased by five is equal to twelve ounces." into an algebraic equation.

Words The weight of the apple increased by five is equal to twelve ounces.

Variable Let w represent the weight of the apple.

Equation $w + 5 = 12$

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EXERCISES *Translate each phrase into an algebraic expression.*

1. seven points less than yesterday's score
2. the number of jelly beans divided into nine piles
3. the morning temperature increased by sixteen degrees
4. six times the cost of the old book
5. two times the difference of a number and eight

Translate each sentence into an algebraic equation.

6. The sum of four and a number is twenty.
7. Fourteen is the product of two and a number.
8. Nine less than a number is three.
9. The quotient of a number and five is eleven.
10. Fifteen less than the product of a number and three is six.

APPLICATIONS

11. Sierra purchased an ice cream cone for herself and three friends. The cost was $8. Define a variable and then write an equation that can be used to find how much Sierra paid for each ice cream cone.

12. Nicholas weighed 83 pounds at his most recent checkup. He had gained 9 pounds since his last checkup. Define a variable and then write an equation to find Nicholas' weight at the previous checkup.

13. There are three times as many people at the amusement park today than there were yesterday. Today's attendance is 12,000. Define a variable and then write an equation to find yesterday's attendance.

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SKILL 21

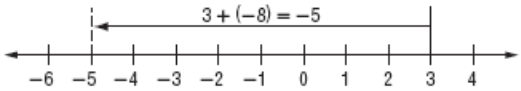
Name _____ Date _____

Adding and Subtracting Integers

You can use a number line to add integers. Locate the first addend on the number line. Move right if the second addend is positive. Move left if the second addend is negative.

EXAMPLE *Find 3 + (−8).*

Start at 3. Since −8 is negative, move left 8 units.



Therefore, 3 + (−8) = − 5.

When you add integers, remember:

- The sum of two positive integers is positive.
- The sum of two negative integers is negative.
- The sum of a positive and negative integer is:
  positive if the positive integer has the greater absolute value.
  negative if the negative integer has the greater absolute value.

To subtract an integer, add its opposite.

EXAMPLE *Find 4 −7.*

4 − 7 = 4 + (−7) To subtract 7, add −7.

= − 3

Find 5 − (−6).

5 − (−6) = 5 + (+ 6) To subtract −6, add + 6.

= 11

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Day 2 Science

Complete Activity 1 or Activity 2 below.

Activity 1: *Earthquake Shakes Up Hawaii*

- Read the article below and answer the questions that follow.
- Para Espanol, prime aquí: http://schools.nyc.gov/Documents/teachandlearn/LearnatHome/ELL/7day2sp.pdf

Vocabulary
Learn the new vocabulary words below. You will use these vocabulary words in today's activity.

- **assess** (*verb*): to make a judgment about something
- **fatality** (*noun*) death resulting from accident or disaster
- **infrastructure** (*noun*) basic structural foundations, like roads, bridges, and so on
- **magnitude** (*noun*) a measure of the amount of energy released by an earthquake, as indicated on the Richter scale

Earthquake Shakes Up Hawaii

HONOLULU, Hawaii (Achieve3000, October 16, 2006). On the morning of October 15, Hawaii experienced its strongest earthquake since 1983. The quake left many people without power, and some had to leave their homes until officials could assess the damage.

The earthquake hit 10 miles north-northwest of the island of Hawaii, also known as the Big Island. The quake measured 6.6 on the Richter scale, and several strong aftershocks followed, including one measuring at least 5.8. Hawaiian earthquakes, which are caused by volcanic activity on the islands, are usually fairly minor. As a result, this quake frightened many residents and tourists.

"We were rocking and rolling," said resident Anne LaVasseur, who was on the second floor of a two-story, wood-framed house on the Big Island when the quake struck. "I was pretty scared. We were swaying back and forth, like King Kong's pushing your house back and forth."

The earthquake caused only minor injuries and no fatalities, but the shaking caused damage on the islands, making some areas unsafe. At one hotel, the water pipes burst, creating a dramatic waterfall down the front of the building. Rockslides in many locations forced officials to close roads. Officials evacuated hotels and hospitals, sending hotel guests to gymnasiums and patients at the affected hospitals to other medical centers.

Soon after the shaking stopped, several areas lost electricity. Why? Power plants in Hawaii have built-in monitors that shut down operations if they detect an earthquake. Plant workers had to reboot all systems in order to restore electricity, a process that took several hours. By Monday morning, Rodney Haraga, director of the Hawaii Department of Transportation, reported that most of the Big Island had power. The island of Oahu, however, was still largely in the dark.

Residents and tourists may have been frightened, but they responded by staying calm. Despite a lack of traffic signals, the roads were quiet. Drivers crossed intersections carefully, while police directed traffic at the busier spots. Unable to depend on their refrigerators, people stocked up on provisions at stores. Lines ran down the

street outside of the Times supermarket in Kaimuki on Oahu on Sunday morning. Within three hours, the store was out of flashlights and candles.

"We're not really panicking or anything," said Iri Park, leaving the store with a cart full of bags. Park was at the store with Japanese tourist Kenji Aoki to stock up on junk food, which requires no cooking. Aoki said he did not take the earthquake too seriously; being from Japan, he's used to even stronger tremors.

Despite the power outage, some gas stations and restaurants were able to open. Near the supermarket, a normally quiet Vietnamese restaurant was packed with people eager to escape their darkened homes. With no TV or computer, Brian Correa and his family had spent the day telling one another stories. At dinnertime, the Correas decided to get some Vietnamese food—but not because they lacked supplies.

"We have stuff at home," Correa said. "We just wanted to get out of the house."

Meanwhile, officials continued to deal with the damage. "We were totally prepared for a disaster such as this, but obviously with a disaster this big you can't be prepared for everything," Haraga explained.

Instructions:
Select the correct answer.

Question 1:
What is this article mainly about?
1. Hawaii recently had the only earthquake in its history.
2. Residents of Hawaii were recently warned about a strong earthquake that could have left people homeless.
3. Hawaii recently had the weakest earthquake in its history.
4. Residents of Hawaii were recently evacuated from their homes and left without power after a major earthquake.

Question 2:
According to the article, which of these is a way that people in Hawaii kept busy in the hours following the earthquake?
1. Studying for school
2. Watching television
3. Shopping for goods
4. Playing video games

Question 3:
In which paragraph could the author *best* place information on how the Richter scale works?
1. Paragraph 1
2. Paragraph 2
3. Paragraph 3
4. Paragraph 4

Day 2 Science (continued)

Question 4:
Which is the closest antonym for the word *evacuate*?
1. Enter
2. Judge
3. Master
4. Cleanse

Question 5:
Based on details in the article, what do Iri Park and Brian Correa have in common?
1. They entertained their families after the earthquake.
2. They shopped for food after the earthquake.
3. They went out of their homes after the earthquake.
4. They stayed in a hotel during the earthquake.

Question 6:
Which reference source would probably contain the most information on the relationship between volcanoes and earthquakes?
1. Atlas
2. Thesaurus
3. Dictionary
4. Encyclopedia

Question 7:
Which of these statements is an opinion?
1. Hawaii experienced an earthquake on October 15.
2. Vietnamese restaurants are the best places to go for dinner.
3. The October 15 earthquake in Hawaii caused no fatalities.
4. Rodney Haraga is the director of the Hawaii Department of Transportation.

Question 8:
Here is a sentence from the article:
Unable to depend on their refrigerators, people stocked up on *provisions* at stores.
A synonym for *provisions* must be _____.
1. Supplies
2. Credit
3. Receipts
4. Damage

Additional Question:

Imagine that you lost power for more than a week. What are three ways that you use electricity? Explain what you would do differently without power.

Use details from the article, as well as your own ideas, in your response.

Write your answer below.

Day 2 Science (continued)

Achieve3000 (www.teenbiz3000.com)

Day 2 Science (continued)

Activity 2: *Science Inquiry Project – Geology (continued): How Seismographs Measure Earthquakes*

Vocabulary
Learn the new vocabulary words below. You will use these vocabulary words in today's activity.

- **Aftershock**: A less powerful earthquake that follows a more forceful one.
- **Magnitude**: A measure of the total amount of energy released by an earthquake.

Directions:
Continue the *Geology* activity you began on Day 1. Below is a sample schedule of how you might complete this assignment over the four days.

- Day 1: Research the history of seismographs from early Chinese cultures to the present day technological design**.** Utilize www.crustal.ucsb.edu/ics/understanding/
- **Day 2: Identify problems past scientists have confronted when attempting to measure earthquake location and intensity. Utilize** www.crustal.ucsb.edu/ics/understanding/
- Day 3: Design a simple seismograph that will track a simulated earthquake and complete a set of blueprints.
- Day 4: Then write and "produce" a 3-5 minute informative commercial for your home seismograph.

Suggested Additional Resources:

- www.crustal.ucsb.edu/ics/understanding/ - Complete the quiz, and read of famous Earthquake accounts
- http://pubs.usgs.gov/gip/earthq1/ - Measure earthquakes, research how earthquakes happen, examine "science fair project" and read how to build a seismometer.

Source: This activity is from Glencoe NY Science, Grade 7, Unit 1: Geology
http://glencoe.mcgraw-hill.com/sites/0078778646/student_view0/unit1/unit_project_3.html

Day 3 Schedule

Subject	Minutes Per Day (At Least!)	Assignments	What Did I Learn Today?
English Language Arts	45	• Learn new vocabulary words from the Vocabulary List • Activity 1: Reading • Activity 2: Identifying Context Clues • Activity 3: Identifying similes and metaphors	•
Math	45	• Skill 3: Simplifying Expressions and Equations	•
Science	45	Complete at least one of the following activities: • Activity 1: *Tsunami Warning System Does its Job (English or Spanish)* • Activity 2: Continue *Geology* activity by designing a simple seismograph	•
Fitness and Health	30	• Exercise for 30 minutes. Choose from the Activity Calendars at the back of this booklet.	•
Arts	30	• Choose one or two activities from Theater Activities at the back of the booklet	•
TV Shows and Websites	30	• Choose TV shows and websites to further your learning at home	•

Day 3 English Language Arts

Vocabulary

Learn new vocabulary words from the Vocabulary List at the back of this packet. Practice using these words in the activities below.

Activity 1: *Reading*

- Continue reading a chapter in the book of your choice.

Activity 2: *Identifying Context Clues*

- Today you are going to practice context clues:
  1. Underline an unfamiliar word.
  2. Circle the clues that give you the meaning of the unfamiliar word.
  3. Use these clues to figure out the meaning of the unfamiliar word.
  4. Use a dictionary to check on your strategy.

- As you read, fill in the Reading Log below.

Text page	What I understood	New or difficult vocabulary	Questions I have

Day 3 English Language Arts (continued)

Activity 3: *Identifying Similes and Metaphors*

- Decide whether each sentence contains a simile or a metaphor. Write the word SIMILE if the sentence contains a simile. Write the word METAPHOR if the sentence contains a metaphor.

Reminder:

- ♦ A **simile** is a comparison using like or as. It usually compares two dissimilar objects.

  For example: *His feet were as big as boats.* We are comparing the size of feet to boats.

- ♦ A **metaphor** states that one thing is something else. It is a comparison, but it does NOT use like or as to make the comparison.

  For example: Her hair is silk. The sentence is comparing (or stating) that hair is silk.

1. The baby was like an octopus, grabbing at all the cans on the grocery store shelves. _____

2. As the teacher entered the room she muttered under her breath, "This class is like a three-ring circus!" _____

3. The giant's steps were thunder as he ran toward Jack. _____

- Now, practice finding similes and metaphors in you're the book you are reading. What is the author really trying to say when he or she is using similes and metaphors. Record your answers in your Writers Notebook.

Day 3 Math

Vocabulary

Learn the new math vocabulary words below. You will use these vocabulary words in the activities today.

- **Term:** An item in a sequence.
- **Coefficient:** The numeric multiplier in an algebraic term

Activity 1: *Simplifying Expressions and Equations*

Please complete the following activity. Solve at least 8 exercises. Solve at least 1 Applications problem (# 15, 16, 17). Be sure to show all of your work.

- Skill 3: Simplifying Expressions and Equations

If you need Spanish activities to review the concept of equations**,** please follow the steps below.

- Step 1: Go to tutorial site: http://destination.nycenet.edu

- Step 2: Login with the following user ID and PW:
  - User: studentnyc
  - Password: student

- Step 3: Click on the Exploration Icon to access the tutorial

- Step 4: Scroll down to Mastering Skills & Concepts: Course V: Pre-Algebra – Spanish

- Step 5: Select the skill/concept to review.
  - Activity 3: 1.4.3 - Checking the Solution to an Equation

Notebook Activity

In your notebook, write a letter to a friend explaining how you would combine like terms and why.

Additional Activity: *Multiplying and Dividing Integers*

Do you have more time? Complete the following activity:

- Skill 22: Multiplying and Dividing Integers

SKILL 3

Name _____ Date _____

Simplifying Expressions and Equations

When an algebraic expression is separated into parts by addition and subtraction signs, each part is called a **term**. The numerical part of a term that contains a variable is called the **coefficient** of the variable. **Like terms** are terms that contain the same variables, such as $3a$ and $7a$ or $9mn$ and $2mn$. A term without a variable is called a **constant**. Constant terms are also like terms. An algebraic expression is in **simplest form** if it has no like terms and no parentheses.

EXAMPLE *Simplify the expression $x + 5(y + 2x)$.*

$x + 5(y + 2x)$	$= x + 5(y) + 5(2x)$	*Distributive Property*
	$= x + 5y + 10x$	*Multiply.*
	$= 1x + 5y + 10x$	*Identity Property*
	$= 1x + 10x + 5y$	*Commutative Property*
	$= (1 + 10)x + 5y$	*Distributive Property*
	$= 11x + 5y$	*Simplify.*

When solving equations, sometimes it is necessary to simplify the equation by combining like terms before the equation can be solved.

EXAMPLES *Solve each equation.*

$6a - 2a + 5 = 17$	
$4a + 5 = 17$	*Combine like terms.*
$4a + 5 - 5 = 17 - 5$	*Subtract 5 from each side.*
$4a = 12$	*Simplify.*
$\frac{4a}{4} = \frac{12}{4}$	*Divide each side by 4.*
$a = 3$	*Simplify.*

$4(2x - 1) = -6(x + 3)$	
$8x - 4 = -6x - 18$	*Distributive Property*
$8x - 4 + 6x = -6x - 18 + 6x$	*Add 6x to each side.*
$14x - 4 = -18$	*Simplify.*
$14x - 4 + 4 = -18 + 4$	*Add 4 to each side.*
$14x = -14$	*Simplify.*
$\frac{14x}{14} = -\frac{14}{14}$	*Divide each side by 14.*
$x = -1$	*Simplify.*

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EXERCISES *Simplify each expression.*

1. $6y + 9y$
2. $-4m + 2m$
3. $13v - 9v$
4. $7z + 5 - 3z + 2$
5. $2p - 11p$
6. $3g - 6 + 6$

Solve each equation.

7. $18p - 2p + 6 = 9 + 5$
8. $10b - 4 - 6b = 24 - 4$
9. $8n + 6 = 19 + 7n$
10. $-3m + 8m = 11 - 4 - 2m$
11. $6(3w + 5) = 2(10w + 10)$
12. $5(3x + 1) = 2(13x - 3)$
13. $3a + 4 - 2a - 7 = 4a + 3$
14. $4(8 - 3w) = 32 - 8(w + 2)$

APPLICATIONS

15. Suppose you buy 5 videos that each cost c dollars, a DVD for \$30, and a CD for \$20. Write an expression in simplest form that represents the total amount spent.

16. Malik earned d dollars raking leaves. His friend, Isaiah, earned three times as much. A third friend, Daniel, earned five dollars less than Malik. Write an expression in simplest form that represents the total amount earned by the three friends.

17. A rectangle has length $2x - 3$ and width $x + 1$. Write an expression in simplest form that represents the perimeter of the rectangle.

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SKILL 22

Name _____ Date _____

Multiplying and Dividing Integers

When multiplying or dividing integers:
If two integers have the same sign, their product or quotient is positive.
If two integers have different signs, their product or quotient is negative.

EXAMPLE *Solve each equation.*

$a = 8 \times (-4)$	*One factor is positive and the other is negative.*
$a = -32$	*The product is negative.*
The solution is -32.	
$b = -3 \times (-12)$	*Both factors are negative.*
$b = 36$	*The product is positive.*
The solution is 36.	
$c = -63 \div (-7)$	*Both factors are negative.*
$c = 9$	*The quotient is positive.*
The solution is 9.	
$d = -52 \div 4$	*The factors have different signs.*
$d = -13$	*The quotient is negative*
The solution is -13.	

EXERCISES ***Tell whether the product or quotient is positive or negative. Then find the product or quotient.***

1. 8×9
2. $4 \times (-5)$
3. $-81 \div (-9)$
4. $-16 \div 4$
5. -5×7
6. $27 \div 3$
7. $56 \div (-8)$
8. $-3 \times (-6)$
9. $-42 \div 7$
10. 6×8

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Solve each equation.

11. $a = -16 \times 4$

12. $b = 120 \div 20$

13. $c = -240 \div (-4)$

14. $d = -64 \div 8$

15. $e = 14 \times (-8)$

16. $f = 144 \div 6$

17. $g = -80 \div (-16)$

18. $h = 14 \times 36$

19. $j = -11 \times 11$

20. $k = -16 \times (-9)$

21. $m = 240 \div (-8)$

22. $n = -315 \div 9$

23. $p = 14 \times 12$

24. $q = 18 \times 0$

25. $r = 285 \div (-15)$

26. $s = -33 \times (-9)$

APPLICATIONS *A full 60-gallon water storage tank drains at a rate of 3 gallons per minute.*

27. How much water is in the tank after 4 minutes?

28. How much water is in the tank after 8 minutes?

29. How long does it take to drain 15 gallons of water?

30. How long does it take to drain the entire tank?

31. Suppose water is added to the tank at a rate of 2 gallons a minute. How long will it take to drain the tank?

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Day 3 Science

Complete Activity 1 or 2 below:

Activity 1: *Tsunami Warning System Does Its Job*

- Read the article below and answer the questions that follow.
- Para Espanol, prime aquí: http://schools.nyc.gov/Documents/teachandlearn/LearnatHome/ELL/7day3sp.pdf

Vocabulary
Learn the new vocabulary words below. You will use these vocabulary words in today's activity.

- **dispatch** (verb): to send off or away with speed
- **meteorologist** (noun): a person who studies the earth's atmosphere, especially its patterns of climate and weather
- **prone** (adjective): likely to do or be affected by something
- **Richter scale** (noun): a scale from one to 10 used to measure how strong an earthquake is
- **sparsely** (adverb): few and widely separated

Tsunami Warning System Does its Job

TOKYO, Japan (Achieve3000, November 17, 2006). A powerful undersea earthquake near Japan on November 15 led officials to issue tsunami warnings. After the danger passed, officials were relieved. There had been no major damage, and the episode had given them a chance to test tsunami warning systems.

Officials became concerned about possible tsunamis after an earthquake measuring 8.1 on the Richter scale struck in the northern Pacific Ocean. Major ocean earthquakes can cause tsunamis thousands of miles away. The quake was located 275 miles north-northeast of the Kuril Islands, which are east of Hokkaido, Japan's northernmost island. Based on this location, officials issued alerts for the sparsely populated, Russia-governed Kuril Islands and for parts of Japan and the U.S.

In Japan, officials directed warnings at Hokkaido. Several thousand people on the coast of the island fled to higher ground after officials predicted a 6.5-foot tsunami. The coastal city of Nemuro dispatched about 20 firetrucks and cars after the warning. City official Masayuki Kikuchi said that the proceedings went smoothly; that is probably because residents of the earthquake-prone region live with the possibility of tsunamis every day.

"There was no panic," Kikuchi said. "Residents made their way to higher ground, just like they do in our annual tsunami drill."

As it turned out, residents did not need to be too concerned. The highest wave measured only 16 inches, and the sea remained fairly calm.

In the U.S., the Pacific Tsunami Warning Center issued alerts for Hawaii and the western U.S. and Canadian coasts. Some areas experienced minor tsunamis, but nothing major occurred. Officials kept the warnings in effect until they could be sure that the danger was over.

Day 3 Science (continued)

"It went very smoothly, and there weren't any major problems at all," said Brian Shiro, a scientist at the center. "We issued a warning for 1,000 kilometers (621 miles) surrounding the earthquake and an advisory for the rest of the Pacific Ocean."

In Crescent City, California, harbor workers noticed an unusual, fast-moving current, which destroyed two floating docks. Another surge followed, damaging a third dock. Several vessels tied to the docks pulled out of their anchorage and likely suffered damage.

"It wasn't wave action," said meteorologist Dave Reynolds. "It was the current that caused the damage. This is almost like a fast-moving river of water that is coming in, so . . . it's the currents that toss the boats around."

Several small tsunamis struck Hawaii. Just before the waves arrived, an undertow developed in the water. One swimmer was pulled through an opening in the seawall, resulting in minor injuries. One 2.5-foot surge flooded a harbor but caused no serious damage. After officials canceled the alerts, local authorities warned people to stay out of the water in case of unusual currents.

Officials have been particularly concerned about tsunamis since 2004. In December of that year, a major quake off the coast of Indonesia caused a 33-foot tsunami. The wall of water killed 213,000 people in 11 countries. Most people had little or no warning about the approaching wave.

The response to this latest quake indicates that tsunami warning systems can be effective.

The Associated Press contributed to this story.

Instructions:

Select the correct answer.

Question 1:
The author probably wrote this article to _____.
1. Show that tsunami warning systems can work and can save lives
2. Explain the difference between an earthquake and a tsunami
3. Show how to prepare for earthquakes and tsunamis
4. Explain the way of life in Japan and Indonesia

Question 2:
The reader can tell from the article that the residents of Nemuro, Japan, were probably _____.
1. Upset that they were not warned ahead of time about a possible tsunami
2. Prepared to leave their homes since they live in an area that is prone to tsunamis
3. Upset about having to leave their homes for the first time because of a possible tsunami
4. Prepared to stay in their homes since they live in an area that is safe from tsunamis

Day 3 Science (continued)

Question 3:
Imagine that someone made the following statements:
"I saw a few small waves, so I thought it was safe to swim. Then, the current was so strong that I got hurt!"
Which person from the article would most likely say this?
1. Dave Reynolds
2. An official from Nemuro
3. Masayuki Kikuchi
4. The swimmer in Hawaii

Question 4:
The reader can tell from the article that at the time of the 2004 tsunami, _____.
1. There must have been a few small towns along the coasts.
2. The tsunami warning system must have been very helpful.
3. There must have been many people living near the coasts.
4. The tsunami warning system must have been brand new.

Question 5:
Based on the article, the reader can predict that _____.
1. People in earthquake-prone areas will continue to resent tsunami warnings.
2. More countries will find ways to stop tsunamis from happening.
3. People in earthquake-prone areas will continue to ignore tsunami warnings.
4. More countries will develop tsunami warning systems.

Question 6:
Why does the author include the quote from the Nemuro city official in the fourth paragraph?
1. To show that tsunami warnings cause stress but at least they save lives
2. To show why tsunami warning systems are not very popular
3. To show that tsunami warnings work well even when they happen regularly
4. To show why tsunami warning systems usually do not work

Question 7:
Which is the closest synonym for the word dispatch?
1. Send out
2. Pull up
3. Drop in
4. Put away

Question 8:
If a town is sparsely populated, this means that _____.
1. There are many people, and they live far apart.
2. There are few people, and they live far apart.
3. There are many people, and they live close together.
4. There are few people, and they live close together.

Day 3 Science (continued)

Additional Question

Explain the value of the tsunami warning systems described in the article. What effect will repeated tsunami warnings have on people over time?

Use ideas from the article, as well as your own ideas, in your response.

Write your answer below.

Achieve3000 (www.teenbiz3000.com)

Day 3 Science (continued)

Activity 2: *Science Inquiry Project – Geology (continued): How Seismographs Measure Earthquakes*

Vocabulary
Learn the new vocabulary words below. You will use these vocabulary words in today's activity.

- **Plate Tectonics**: In geology, a theory that the Earth's lithosphere is divided into a number of large, plate-like sections that move as distinct masses.
- **Lithosphere**: The outer part of the Earth, consisting of the crust and upper mantle.

Directions:
Continue the *Geology* activity you began on Day 1. Below is a sample schedule of how you might complete this assignment over the four days.

- Day 1: Research the history of seismographs from early Chinese cultures to the present day technological design. Use www.crustal.ucsb.edu/ics/understanding/
- Day 2: Identify problems past scientists have confronted when attempting to measure earthquake location and intensity.
- **Day 3: Design a simple seismograph that will track a simulated earthquake and complete a set of blueprints.** Use www.crustal.ucsb.edu/ics/understanding/
- Day 4: Then write and "produce" a 3-5 minute informative commercial for your home seismograph.

Suggested Additional Resources:

- www.crustal.ucsb.edu/ics/understanding/ - Complete the quiz, and read of famous Earthquake accounts
- http://pubs.usgs.gov/gip/earthq1/ - Measure earthquakes, research how earthquakes happen, examine "science fair project" and read how to build a seismometer.

Source: This activity is from Glencoe NY Science, Grade 7, Unit 1: Geology
http://glencoe.mcgraw-hill.com/sites/0078778646/student_view0/unit1/unit_project_3.html

Day 4 Schedule

Subject	Minutes Per Day (At Least!)	Assignments	What Did I Learn Today?
English Language Arts	45	• Learn new vocabulary words from the Vocabulary List • Activity 1: Practice Taking Notes • Activity 2: Identifying Imagery	•
Math	45	• Lesson 9.1 Study Guide and Intervention • Lesson 9.1 Skills Practice	•
Science	45	Complete at least one of the following activities: • Activity 1: *Former President to Help Quake Victims (English or Spanish)* • Activity 2: Finish the *Geology* activity by writing a commercial	•
Fitness and Health	30	• Exercise for 30 minutes. Choose from the Activity Calendars at the back of this booklet.	•
Arts	30	• Choose one or two activities from Music Activities at the back of the booklet	•
TV Shows and Websites	30	• Choose TV shows and websites to further your learning at home	•

Day 4 English Language Arts

Vocabulary

Learn new vocabulary words from the Vocabulary List at the back of this packet. Practice using these words in the activities below.

Activity 1: *Practice Taking Notes*

- Continue reading a chapter in your book of choice. Today you are going to practice taking notes as you read:

What I Read	What I Know	What I can Infer

Activity 2: *Identifying Imagery*

- Imagery involves one or more of your five senses (hearing, taste, touch, smell, and sight). An author uses a word or phrase to stimulate your memory of those senses. These memories can be positive or negative, which will contribute to the mood of the story.

- How does the author of your book use imagery? Cite three examples and describe how this imagery helps you comprehend the story.

- Use the framework below to tell about imagery used in the story.

The author uses several examples of imagery throughout the book. For example, the author used imagery to tell about _____.

*The author also used imagery to describe (tell about)*_____

_____. *Finally, the author described*

_____ *by using vivid language of imagery. The imagery used in the book helped me to better understand* _____.

Day 4 Math

Vocabulary

Learn the new math vocabulary words below. You will use these vocabulary words in the activities today.

- **Backtracking**: The process of using a flowchart to work backward, starting with the output and undoing each operation to find the input
- **Flowchart**: A diagram, using ovals and arrows, that shows the steps for going from an input to an output.
- **Guess-Check-and-Improve:** A method for solving an equation that involves first guessing the solution, then checking the guess by substituting into the original equation, and then using the result to improve the guess until the correct solution is found.

Activity 1: *Find a Solution*

Please complete the following assignments:

- Lesson 9.1 Study Guide and Intervention: Find a Solution Method
  - Complete all problems. Be sure to show all of your work.
- Lesson 9.1 Skills Practice: Find a Solution
  - Solve at least 15 problems. Be sure to show all of your work.

If you need Spanish activities to review the concept of equations**,** please follow the steps below.

- Step 1: Go to tutorial site: http://destination.nycenet.edu
- Step 2: Login with the following user ID and PW:
  - User: studentnyc
  - Password: student
- Step 3: Click on the Exploration Icon to access the tutorial
- Step 4: Scroll down to Mastering Skills & Concepts: Course V: Pre-Algebra – Spanish
- Step 5: Select the skill/concept to review.
  - Activity 4: 1.5.3 - Substituting Values and Solving an Equation

Notebook Activity

In your notebook, describe how backtracking works.

Name Date

Lesson 9.1 Study Guide and Intervention

Find a Solution Method

Example 1 **Use backtracking to solve $7v - 3 = 25$.**

Create a flowchart for the equation $7v - 3 = 25$. The input is v, or the value you want to find. The output is 25.

Since you need to subtract 3 to get 25, the value in the second oval must be 28.

Since you need to multiply by 7 to get 28, the value in the first oval must be 4.

The solution is 4. Check with substitution: $(4)7 - 3 = 28 - 3 = 25$.

Example 2 **Use guess-check-and-improve to solve $12 + x = 6 + 3x$.**

Guess	$12 + x$	$6 + 3x$	Difference
1	13	9	$13 - 9 = 4$

Begin with 1 as a guess for the solution. Substituting 1 for x gives 13 for the left side of the equation and 9 for the right side. The difference between 13 and 9 is 4, so you might try 2 or 3 as your second guess.

Guess	$12 + x$	$6 + 3x$	Difference
3	15	15	$15 - 15 = 0$

Substituting 3 for x gives 15 on both sides.

The solution is 3.

Exercises

Use backtracking to solve each equation.

1. $4y + 1 = 13$ **2.** $2(2x + 6) = 26$ **3.** $7 = \frac{-3c + 2}{-1}$

Use guess-check-and-improve to solve each equation.

4. $11 + 7n = 4$ **5.** $\frac{(15 + 2p)}{3} = 9$ **6.** $5(z + 2) = 6(2z - 3)$

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Lesson 9.1 Skills Practice

Find a Solution Method

Use backtracking to solve each equation.

1. $2x + 1 = 9$

2. $7k - 3 = 32$

3. $\frac{3w + 5}{7} = 23$

4. $5(n - 8) = 25$

5. $2(2t - 1) = 14$

6. $\frac{7b + 1}{4} = 2$

7. $8x - 1 = 63$

8. $2x - 5 = 15$

9. $54 = 6\left(\frac{4 - 7v}{2}\right)$

10. $8\left(\frac{5b + 12}{3} - 1\right) = 64$

11. $4\left(20 - \frac{4n + 27}{3}\right) = 40$

12. $\frac{10r - 2}{5} + 8 = 11$

13. $3 = \frac{2 - 4p}{9}$

14. $2 = 6 - \left(\frac{7 - 15z}{10}\right)$

Use guess-check-and-improve to solve each equation.

15. $2(p + 7) = 5p + 2$

16. $3y + 10 = y + 2$

17. $4g - 8 = 5g - 11$

18. $24 - 8g = 2 - 30g$

19. $18 - 3w = w - 6$

20. $9(2d + 5) = 3d$

21. $\frac{7x + 2}{4} = \frac{13x - 2}{6}$

22. $\frac{4m - 8}{3} = 2m - 6$

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Day 4 Science

Choose Activity 1 or 2 below:

Activity 1: *Former President to Help Quake Victims*

- Read the article below and answer the questions that follow.
- Para Espanol, prime aquí: http://schools.nyc.gov/Documents/teachandlearn/LearnatHome/ELL/7day4sp.pdf

Vocabulary
Learn the new vocabulary words below. You will use these vocabulary words in today's activity.

- **diplomatic** (adjective): having to do with relations among nations
- **envoy** (noun): a representative from an organization, usually on a specific mission
- **resources** (noun): available wealth or supplies
- **tragedy** (noun): a disaster
- **tremor** (noun): shaking or moving of the earth

Former President to Help Quake Victims

ISLAMABAD, Pakistan(Achieve3000, December 16, 2005). Former President George H. W. Bush, who is the father of President George W. Bush, is working to help millions of people. How? He has accepted a role in the efforts to rebuild parts of Asia after a major earthquake.

The UN has appointed Bush to be a special envoy for reconstruction in quake-hit areas of South Asia. In accepting the position, Bush took on a major task. The earthquake shook parts of Pakistan, India, and Afghanistan on October 8. Its tremors flattened buildings and sent landslides down the slopes of the Himalayan Mountains. Approximately 87,000 people died in the disaster; three million people are homeless.

Since the earthquake, Pakistan's military has been running one of the biggest relief operations in the world. In addition, several countries and aid agencies have provided money, food, and supplies. It has not been easy—many of the victims live in mountainous areas, where helicopters cannot land with supplies. In addition, boulders from landslides and knocked-down trees have blocked many roads for weeks. Relief workers have had to use mules to reach some of the more remote areas.

Former President Bush joined the effort at a critical time. He made his announcement in mid-December, just before the peak of the region's harsh winter season. Officials were concerned because many of the victims were living in lightweight tents that are not designed for cold weather. Bush's appointment came just after the UN asked world leaders for more money. The UN needs this aid so it can provide earthquake survivors with thick blankets and heavy shelter materials.

At a news conference to discuss his new role, Bush said that he would appeal to world leaders to continue to give money. UN Secretary-General Kofi Annan added that Bush's diplomatic skills would be critical to getting the resources necessary to help all of the survivors. This needs to happen as quickly as possible, Annan explained.

"Every delay in funding poses tremendous risks," said Annan. Bush said that he is pleased to have the chance to help improve a terrible situation.

Day 4 Science (continued)

"I have been heartbroken over the tragedy in Pakistan," Bush said.

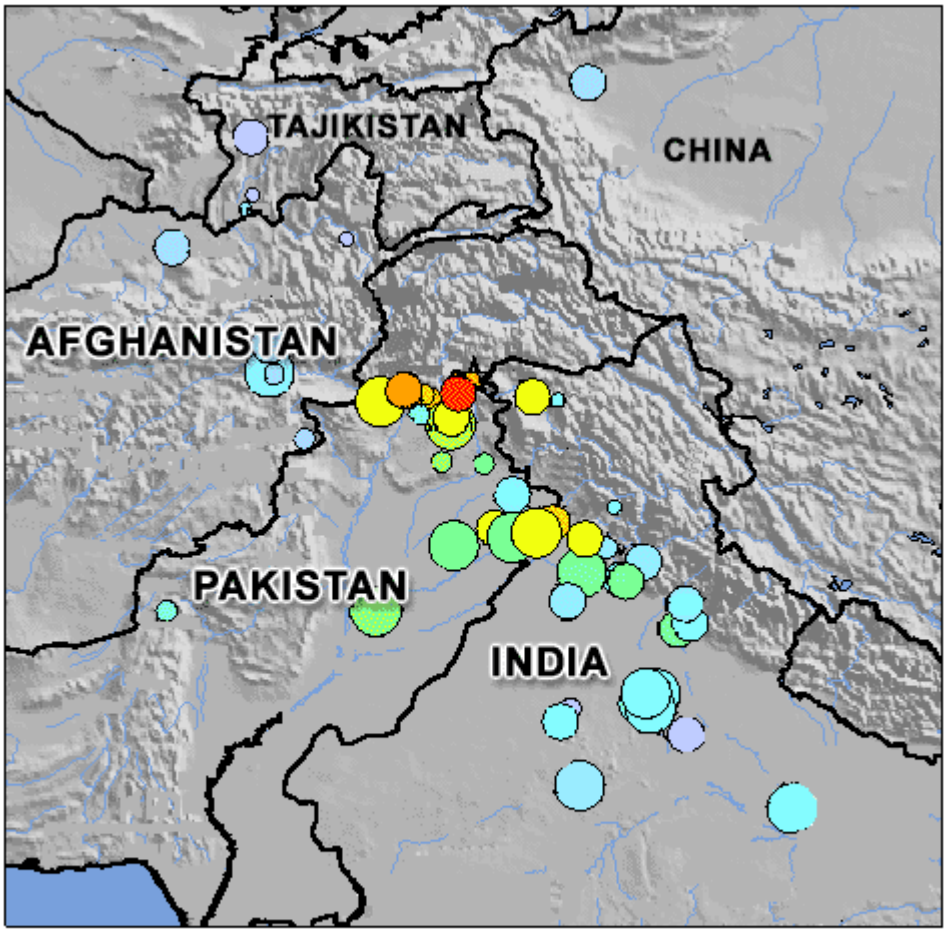
Bush added that he is confident that world leaders will give what they can, as fast as they can.

The Associated Press contributed to this story.

Instructions:

Select the correct answer.

Question 1:



INTENSITY	1	2-3	4	5	6	7	8	9	10+
Shaking	none	none	light	moderate	strong	very strong	severe	violent	extreme
Damage	none	none	none	very light	light	moderate	mod / heavy	heavy	very heavy

Take a look at the map above. On the day the earthquake hit, which was true in western China?

1. The earthquake caused moderate shaking.
2. The earthquake caused light shaking.
3. The earthquake caused moderate damage.
4. The earthquake caused light damage.

Day 4 Science (continued)

Question 2:
What is this article mainly about?
1. A strong earthquake hit three nations, causing many deaths.
2. Former President Bush has expressed his deepest sympathy for victims of a recent earthquake.
3. A strong earthquake hit three nations, causing many landslides.
4. Former President Bush has agreed to help raise funds to help victims of a recent earthquake.

Question 3:
Which question is not answered by the article?
1. Before former President Bush was selected as a special envoy, what had the U.S. done to help the earthquake victims in Asia?
2. Why does the UN feel that it is important to get help to the earthquake victims now?
3. Before former President Bush was selected as a special envoy, what had several countries and aid agencies done to help earthquake victims in Asia?
4. Why have relief operations for the earthquake victims in Asia been difficult?

Question 4:
What made the early relief efforts after the earthquake difficult?
1. Shelters
2. Lack of time
3. Mountains
4. Lack of money

Question 5:
According to the article, which concern must be addressed immediately?
1. Making sure that people get warm blankets and heavy tents for the winter
2. Stopping people from trying to knock down trees and build new places to live
3. Making sure that people get warm food and flu vaccines for the winter
4. Stopping people from trying ride mules into the mountains and find new places to live

Question 6:
Which of these is a synonym for the word envoy?
1. Doctor
2. Geologist
3. Counselor
4. Representative

Question 7:
Which of these is not a resource?
1. Food
2. Earthquake
3. Shelter
4. Clothing

Day 4 Science (continued)

Question 8:
Which of these details would best fit into this article?
1. Information about the frequency of earthquakes in Europe
2. Information about earthquakes that hit America in the past
3. Information about the strength of the earthquake in Asia
4. Information about earthquakes that hit Australia in the past

Additional Question

Imagine that you are a UN special envoy chosen to help with the Asian earthquake. You have been asked to raise money for the earthquake-affected areas.

Write a dialogue that you might have with a world leader. Use your best diplomatic skills to convince the leader to help with this effort. Use details from the article to support your argument.

Write your answer below.

Day 4 Science (continued)

Activity 2: *Science Inquiry Project – Geology (continued): How Seismographs Measure Earthquakes*

Vocabulary
Learn the new vocabulary words below. You will use these vocabulary words in today's activity.

- **Crust**: The solid, outermost layer of the Earth.
- **Fault**: A crack in a rock mass along which there has been movement.

Directions:
Complete the *Geology* activity you began on Day 1. Below is a sample schedule of how you might complete this assignment over the four days.

- Day 1: Research the history of seismographs from early Chinese cultures to the present day technological design. Use www.crustal.ucsb.edu/ics/understanding/
- Day 2: Identify problems past scientists have confronted when attempting to measure earthquake location and intensity.
- Day 3: Design a simple seismograph that will track a simulated earthquake and complete a set of blueprints. Use www.crustal.ucsb.edu/ics/understanding/
- **Day 4: Then write and "produce" a 3-5 minute informative commercial for your home seismograph.** Try to use all of the vocabulary words you have learned in your commercial.

Suggested Additional Resources:

- www.crustal.ucsb.edu/ics/understanding/ - Complete the quiz, and read of famous Earthquake accounts
- http://pubs.usgs.gov/gip/earthq1/ - Measure earthquakes, research how earthquakes happen, examine "science fair project" and read how to build a seismometer.

Source: This activity is from Glencoe NY Science, Grade 7, Unit 1: Geology
http://glencoe.mcgraw-hill.com/sites/0078778646/student_view0/unit1/unit_project_3.html

Day 5 Schedule

Subject	Minutes Per Day (At Least!)	Assignments	What Did I Learn Today?
English Language Arts	45	• Learn new vocabulary words from the Vocabulary List • Activity 1: Reading • Activity 2: Writing	•
Math	45	• Skill 8: Work backward	•
Science	45	Complete at least one of the following activities: • Activity 1: *Keeping the Bridges Safe (English or Spanish)* • Activity 2: *Dynamic Equilibrium – The Human Animal*	•
Fitness and Health	30	• Exercise for 30 minutes. Choose from the Activity Calendars at the back of this booklet.	•
Arts	30	• Choose one or two activities from Art Activities at the back of the booklet	•
TV Shows and Websites	30	• Choose TV shows and websites to further your learning at home	•

Day 5 English Language Arts

Vocabulary

Learn new vocabulary words from the Vocabulary List at the back of this packet. Practice using these words in the activities below.

Activity 1: *Reading*

- Read a new chapter in your book. Use the following chart to answer questions about your reading:

WHO	WHAT	WHERE	WHEN	WHY	HOW

Activity 2: *Writing*

- Write a five-paragraph essay on one of the following topics:
  - Why weekends should be longer
  - Here's what a new student needs to know about my school
  - Why students should (or should not) get a two-month in the summer

- Use this framework to help you write your essay.

Introductory Paragraph:

- Give some background information on the topic of your choice.
- Take a stand. Give your opinion on the issues presented. Write a sentence that expresses your opinion (thesis).

Paragraph 2:

- Support your idea with an explanation, details, and/or an example.

Paragraph 3:

- Provide more explanations, examples, and details that support your opinion. (Do not repeat the same ones from paragraph 2.)

Paragraph 4:

- Tell why some people may have a different opinion on this topic? Why would some people disagree with you?

Closing Paragraph:

- Restate your thesis. Summarize your main points. End with a strong demand for action.

Day 5 Math

Vocabulary

Learn the new math vocabulary words below. You will use these vocabulary words in the activities today.

- **Backtracking**: The process of using a flowchart to work backward, starting with the output and undoing each operation to find the input

Activity 5: *Work Backwards*

Please complete the following assignment. Solve at least three exercises. Solve at least 2 Applications problems. Be sure to show all of your work.

- Skill 8: Work Backwards

If you need Spanish activities to review the concept of equations**,** please follow the steps below.

- Step 1: Go to tutorial site: http://destination.nycenet.edu

- Step 2: Login with the following user ID and PW:
  - User: studentnyc
  - Password: student
- Step 3: Click on the Exploration Icon to access the tutorial

- Step 4: Scroll down to Mastering Skills & Concepts: Course V: Pre-Algebra – Spanish

- Step 5: Select the skill/concept to review.
  - Activity 5: 1.5 - Unit Review

Notebook Activity

In your notebook, explain why backtracking works.

Additional Activities: *A Model for Solving Equations*

Do you have more time? Complete the following activities:

- Lesson 9.2: Study Guide and Intervention: A Model for Solving Equations
- Lesson 9.2: Skills Practice: A Model for Solving Equations

SKILL 8

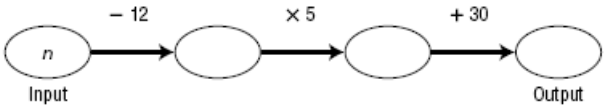
Name _____ Date _____

Work Backward

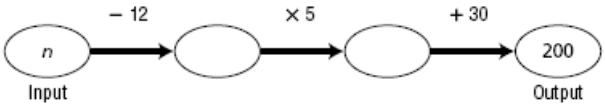
Some problems start with the end result and ask for something that happened earlier. The strategy of **working backward**, or **backtracking**, can be used to solve problems like this. To use this strategy, start with the end result and undo each step.

EXAMPLE ***A number is decreased by 12. The result is multiplied by 5, and 30 is added to the new result. The final result is 200. What is the number?***

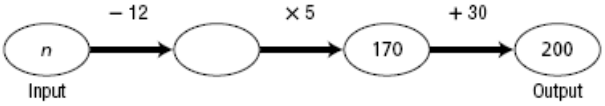
Use a flowchart to show the steps in the computation.



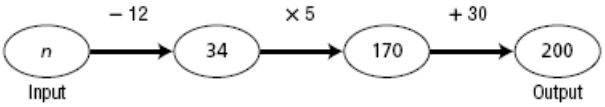
Find the solution by starting with the output.



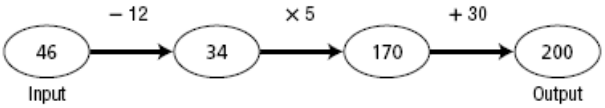
Since 30 was added to get 200, subtract 30. 200 − 30 = 170



Next, divide 170 by 5. 170 ÷ 5 = 34



Then, add 12 to 34. 34 + 12 = 46



Thus, the number is 46.

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EXERCISES *Solve by working backward.*

1. A number is added to 12, and the result is multiplied by 6. The final answer is 114. Find the number.

2. A number is divided by 3, and the result is added to 20. The result is 44. What is the number?

3. A number is divided by 8, and the result is added to 12. The final answer is 78. Find the number.

4. Twenty five is added to a number. The sum is multiplied by 4, and 35 is subtracted from the product. The result is 121. What is the number?

5. A number is divided by three, and 14 is added to the quotient. The sum is multiplied by 7. The product is doubled. The result is 252. What is the number?

APPLICATIONS

6. A bacteria population doubles every 8 hours. If there are 1,600 bacteria after 2 days, how many bacteria were there at the beginning?

7. Each school day, Alexander takes 35 minutes to get ready for school. He takes 5 minutes to walk to Jaaron's house. The two boys take 15 minutes to walk from Jaaron's house to school. School starts at 8:10 A.M. If the boys want to get to school at least 10 minutes before school starts, what is the latest Alexander must get out of bed?

8. A fence is put around a dog pen 10 feet wide and 20 feet long. Enough fencing is left over to also fence a square garden with an area of 25 square feet. If there are 3 feet left after the fencing is completed, how much fencing was available at the beginning?

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Name **Date**

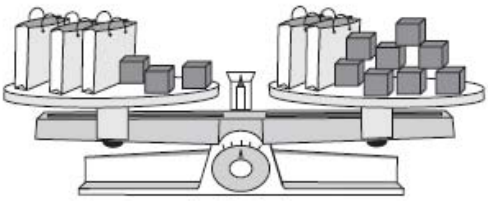
Lesson 9.2 Study Guide and Intervention

A Model for Solving Equations

Balance puzzles help you visualize the steps involved in solving equations.

- In any puzzle, each bag must hold the same number of blocks.
- The total number of blocks on each side must be the same.

Example 1 **Write an equation to fit the balance puzzle. Let x represent the number of blocks in each bag. Use the puzzle to find the value of x.**



Step 1 Use $3x$ to represent 3 bags and $2x$ to represent 2 bags.

3 bags and 3 blocks is $3x + 3$.

2 bags and 8 blocks is $2x + 8$.

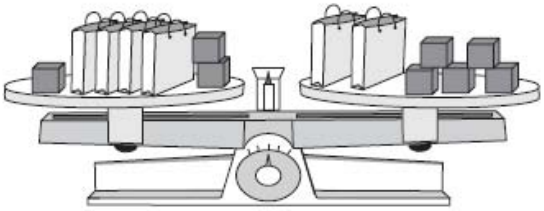
The equation is $3x + 3 = 2x + 8$.

Step 2 Remove 2 bags from each side and 3 blocks from each side.

Each bag has 5 blocks in it, so x is 5.

Example 2 **Draw a balance puzzle for $4x + 3 = 2x + 5$. Use your puzzle to solve the equation.**

Step 1 Let x represent the number of blocks in each bag.



Step 2 If you eliminate 2 bags and 3 blocks from each side, you will have 2 bags on the left side and 2 blocks on the right side. So, each bag holds 1 block.

The solution is 1. Check your solution: $4(1) + 3 = 7$; $2(1) + 5 = 7$.

Exercises

Solve.

1. Write an equation to fit a balance puzzle that has 5 bags and 6 blocks on its left side and 4 bags and 10 blocks on its right side.

2. Draw a balance puzzle for $2x + 9 = 6x + 1$. Use your puzzle to solve the equation.

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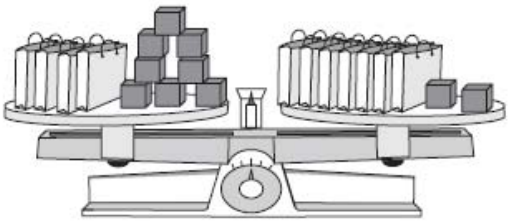
Name Date

Lesson 9.2 Skills Practice

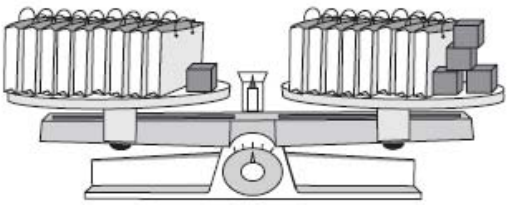
A Model for Solving Equations

Write an equation to fit the balance puzzle. Let x represent the number of blocks in each bag. Then use the puzzle to find the value of x.

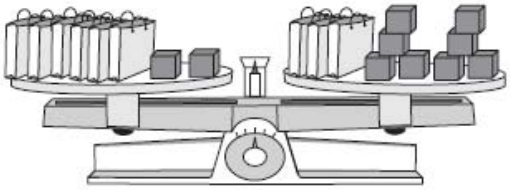
1.



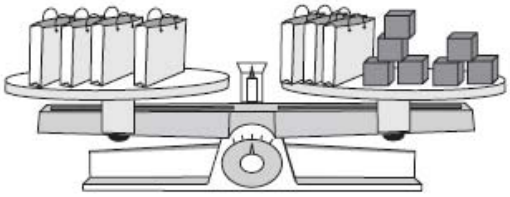
2.



3.



4.



Draw a balance puzzle to represent the equation. Use your puzzle to solve the equation. Check your solution by substituting it into the equation. (Hint: In these puzzles, the bags might hold fractions of blocks.)

5. $2x + 7 = 4x + 3$

6. $3x + 6 = 5x + 1$

7. $2n + 6 = 8n + 3$

8. $6n + 9 = 9n + 6$

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Day 5 Science

Choose Activity 1 or Activity 2 below:

Activity 1: *Keeping Bridges Safe*

- Read the article below and answer the questions that follow.
- Para Espanol, prime aquí: http://schools.nyc.gov/Documents/teachandlearn/LearnatHome/ELL/7day5sp.pdf

Vocabulary
Learn the new vocabulary words below. You will use these vocabulary words in today's activity.

- **access** (verb): to get to something
- **enclosure** (noun): space that is closed off
- **implement** (verb): to put into action
- **seismic** (adjective): of or relating to earthquakes

Keeping Bridges Safe

BURLINGTON, Vermont (Achieve3000, August 29, 2007). Steve Arms wants to make America's bridges as safe as possible. That's why he and his company, MicroStrain Inc., are experimenting with wireless sensing technology that could play a role in determining whether bridges are in good condition.

The wireless, solar-powered sensor system can provide information on strain, seismic activity, and vibrations on bridges. How do the sensors work? First, they use six-by-nine-inch panels to harvest energy from the sun. The energy is stored in rechargeable batteries, which power the devices that record information from inside watertight enclosures. Wireless connections send the information to computers. Since the sensors' batteries are rechargeable, officials do not need to replace them manually once the sensors are installed in hard-to-access places.

The sensors are already on the Corinth Canal Bridge in Greece and on Goldstar Bridge in Connecticut. The Greek bridge was outfitted with the solar-powered version last November; the sensor for the Goldstar Bridge was completed in August. Each device has a different price tag, depending on its individual design. The Greek bridge, for example, has a permanent sensor. Why? It is in an area with a great deal of seismic activity. Other bridges may be outfitted with less costly sensors on a temporary basis to measure their strength.

Sensors are important because they may be able to keep bridges safe. In August, a bridge in Minnesota collapsed, killing at least 13 people. Officials are not sure what caused the collapse, but the problem may have been structural. In some cases, sensors can notify authorities about structural problems so that they can be corrected.

According to experts, the wireless sensors could change the way bridges are designed and protected.

"There are a handful of technologies that are promising to take the field of bridge engineering from where it is to a different plateau," said Drexel University engineering professor A. Emin Aktan. "One of them is wireless sensing." Aktan has used MicroStrain's products in research for the Federal Highway Administration. "Wireless sensing really is a major leapfrog over [traditional, wired] types of sensing. You save maybe 60 to 70 percent of the labor, the costs, and trouble."

Day 5 Science (continued)

Still, engineers are not sure whether the wireless sensors will be widely used in the future.

"It looks promising, but it does require effort, dedication, and maybe another year or so before we can have a system we can say 'Five states can take this and adopt it and implement it,'" Aktan said.

Steve Arms, who is president of MicroStrain, says he cannot be sure whether sensors could help prevent collapses like the one in Minneapolis. First, authorities need to determine whether the cause of that collapse was structural. If so, sensors could be used on other similarly designed bridges to help authorities monitor their health.

John DeWolf, who is researching the solar-powered sensors, said the devices fill a need.

"It greatly expands what we can do with monitoring," said DeWolf. "You can put sensors where you cannot get at them readily. You no longer have to run a wire to them, or change batteries. It's very exciting."

The Associated Press contributed to this story.

Instructions: Select correct answer.

Question 1:
According to the article, why are solar-powered sensors important for bridges?
1. They are more costly than other bridge safety devices.
2. They can be placed permanently on all bridges in the U.S.
3. They are more reliable than other bridge safety devices.
4. They can provide information on seismic activity and vibrations.

Question 2:
The best alternate headline for this article would be _____.
1. Solar Sensors Are Now Wireless
2. Solar Sensors Can Monitor Bridge Strength
3. Solar Sensors Placed on Bridge in Greece
4. Solar Sensors Used in Hard-to-Reach Places

Question 3:
Which question is not answered by the article?
1. Where have the some of the sensors been used already?
2. How much does a permanent sensor cost?
3. Where did a bridge in the United States collapse?
4. How do the sensors help keep bridges safe?

Question 4:
Which of these is a statement of opinion?
1. Wireless solar sensors use six-by-nine-inch panels to get energy from the sun.
2. Wireless solar sensors are sold by a company called MicroStrain Inc.
3. Wireless solar sensors send the information that they gather to computers.
4. Wireless solar sensors are the best way to keep bridges and people safe.

Day 5 Science (continued)

Question 5:
Which is the closest synonym for the word access?
1. Enter
2. Propel
3. Illustrate
4. Overcome

Question 6:
Which sentence fits best into the fourth paragraph of the article?
1. If wireless sensors were not so expensive, more officials would use them on bridges.
2. Wireless sensors are becoming more widely used as bridge officials learn about them.
3. If wireless sensors had been placed on the bridge, they might have helped to prevent the disaster.
4. Wireless sensors are used on buildings in addition to bridges to keep all of these structures safe.

Question 7:
The reader can infer from the article that _____.
1. The solar sensors are used much more often in countries other than the United States.
2. Steve Arms is confident that the sensors can prevent all bridges from collapsing.
3. The people who live near the Corinth Canal Bridge must be familiar with earthquakes.
4. Steve Arms runs one of the many companies that is competing with MicroStrain.

Question 8:
The article states:
In some cases, sensors can notify authorities about structural problems so that they can be corrected. According to experts, the wireless sensors could change the way bridges are designed and protected.
Which would be the closest synonym for the word notify?
1. Detect
2. Exceed
3. Inform
4. Oppose

Additional Question

Explain how the solar-powered sensors discussed in the article work. How might these sensors make bridges safer?

Support your answer with details from the article, as well as ideas of your own.

Write your answer below.

_____
_____
_____
_____
_____
_____
_____

Day 5 Science (continued)

Achieve3000 (www.teenbiz3000.com)

Day 5 Science (continued)

Activity 2: *Dynamic Equilibrium - The Human Animal*

If you have not already done so, complete the *Geology* activity. If you have completed *Geology*, begin the activity *Dynamic Equilibrium: The Human Animal*.

Vitamins play an important role in body functions. For example, vitamin B1 is essential for the metabolism of carbohydrates and for normal nerve and heart function. Pork, kidney beans, and whole-grain cereals are good sources of vitamin B1. Many people take a multi-vitamin supplement to make sure they are getting enough of the essential vitamins their body needs.

Vocabulary

Dynamic Equilibrium: Any various complex organic compounds that are needed in small amounts for normal growth and activity of the body.

Metabolism: The chemical processes by which cells produce the substances and energy needed to sustain life

Directions: Research the role of vitamin B 1, or another vitamin from the list below, in the body. What is the recommended daily allowance for the vitamin? Make a list of foods that are rich in the vitamin you have chosen and create a menu for a full day's meals (breakfast, lunch, and dinner), making sure that each meal contains at least one food from the list. Your menu should include art work as well as complete sentences. Use this site for research on various vitamins http://www.merck.com/mmhe/sec12/ch154/ch154f.html . For medical conditions please use this site http://www.lifeclinic.com/focus/nutrition/nutrition.asp. You should take about one hour to complete this assignment.

Vitamin List

Vitamin A
Vitamin B 1
Vitamin B 2
Vitamin B 3
Vitamin B 5
Vitamin B 6
Vitamin B 9
Vitamin C
Vitamin D
Vitamin E
Vitamin K

Additional Resources:

Visit these web sites for more information on vitamins. Selected pages from some of these sites are included in the following pages.

All Vitamins: http://www.merck.com/mmhe/sec12/ch154/ch154a.html
Nutrition Facts and Information: http://www.lifeclinic.com/focus/nutrition/nutrition.asp
The Vitamins and Nutrition Center: http://www.vitamins-nutrition.org/
Kids Health – Vitamins: http://kidshealth.org/kid/stay_healthy/food/vitamin.html
How Vitamin B Works: http://home.howstuffworks.com/vitamin-b.htm

Source: This activity is from Glencoe NY Science Grade 7 Unit 3: Dynamic Equilibrium: The Human Animal http://glencoe.mcgraw-hill.com/sites/0078778646/student_view0/unit3/unit_project_3.html

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SECTION Disorders of Nutrition and Metabolism

SUBJECT Vitamins

TOPICS Introduction · Folate · Niacin · Riboflavin · Thiamin · Vitamin A · Vitamin B_{12} · Vitamin B_6 · Vitamin C · Vitamin D · Vitamin E · Vitamin K

Search

Index Sections

A B C D E F G H I
J K L M N O P Q R
S T U V W X Y Z

In This Topic

Vitamin C
Vitamin C Deficiency
Symptoms
Diagnosis and Treatment
Vitamin C Excess

Back to Top

Vitamin C

(Ascorbic Acid)

Vitamin C (ascorbic acid) is essential for the formation, growth, and repair of bone, skin, and connective tissue (which binds other tissues and organs together and includes tendons, ligaments, and blood vessels). Vitamin C helps maintain healthy teeth and gums. It helps the body absorb iron, which is needed to make red blood cells. Vitamin C also helps burns and wounds heal. Like vitamin E, vitamin C is an antioxidant: It protects cells against damage by free radicals, which are by-products of normal cell activity that participate in chemical reactions. Some of these reactions can be harmful.

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Pronunciations

atherosclerosis

sclerosis

VITAMIN C DEFICIENCY

- Not eating enough fresh fruits and vegetables can cause the deficiency.
- People feel tired, weak, and irritable.
- Severe deficiency, called scurvy, causes bruising, gum and dental problems, dry hair and skin, and anemia.
- The diagnosis is based on symptoms and sometimes blood tests.
- Increasing consumption of fresh fruits and vegetables or taking supplements by mouth usually corrects the deficiency.

In adults, vitamin C deficiency usually results from a diet low in vitamin C. For example, vitamin C deficiency may result from a diet deficient in fresh f and vegetables. Also, cooking can destroy some of the vitamin C in food. Pregnancy, breastfeeding, disorders that cause a high fever or inflammation, surgery, and burns car significantly increase the body's requirements for vitamin C and the risk of vitamin C deficiency. Smoking increases the vitamin C requirement by 30%.

Scurvy: Severe vitamin C deficiency causes scurvy. Scurvy in infants is rare because breast milk usually supplies enough vitamin C and infant formulas are fortified with the vitamin. Scurvy is rare in the United States but may occur in alcoholics and older people who are malnourished.

Symptoms

Adults feel tired, weak, and irritable if their diet is low in vitamin C. They may lose weight and have vague muscle and joint aches.

Did You Know...

- Cooking can destroy some of the vitamin C in foods.
- Pregnancy, breastfeeding, fever, surgery, and smoking greatly increase the body's requirements f vitamin C.

The symptoms of scurvy develop after a few months of deficiency. Bleeding may occur under the skin (particularly around hair follicles or as bruises), around the gums, and into the joints. The gums become swollen, purple, and spongy. The teeth eventuall loosen. The hair becomes dry and brittle, and the skin becomes dry, rough, and scaly. Anemia may develop. Infections may develop, and wounds do not heal.

Infants may be irritable, have pain when they move, and lose their appetite. Infants do n gain weight as they normally do. In infants and children, bone growth is impaired, and bleeding and anemia may occur.

Diagnosis and Treatment

The diagnosis of scurvy is based on symptoms. Measuring the vitamin C level in blood help establish the diagnosis, but this test is not always available. In children, x-rays are done to check for impaired bone growth.

The deficiency can be prevented by consuming the recommended amounts of fresh frui and vegetables or by taking the recommended amount of vitamin C in daily supplement Smokers require more.

Scurvy is treated with high doses of daily vitamin C supplements. Most symptoms disap after 1 to 2 weeks. Vitamin C plus iron supplements can cure the anemia.

VITAMIN C EXCESS

Some people take high doses of vitamin C because it is an antioxidant, which protects against damage by free radicals. Free radicals are thought to contribute to many disord such as atherosclerosis, cancer, lung disorders, the common cold, eye cataracts, and memory loss. Whether taking high doses of vitamin C protects against or has any benef effect on these disorders is unclear. Evidence of a protective effect against cataracts is strongest.

High doses (up to the safe upper limit—2000 milligrams a day) of vitamin C are usually toxic to healthy adults. Occasionally, higher doses cause nausea or diarrhea and interfe with the interpretation of some blood test results.

Last full review/revision August 2007 by Larry E. Johnson, MD

Back to Top

Previous: Vitamin B_6

Next: Vitami

Audio Figures Photographs Pronunciations Sidebar Tables Videos

Search here...

Kids Home

Feelings

Staying Healthy

Illnesses & Injuries

How the Body Works

Growing Body & Mind

Kids Talk

Cooking & Recipes

People, Places & Things That Help

Staying Safe

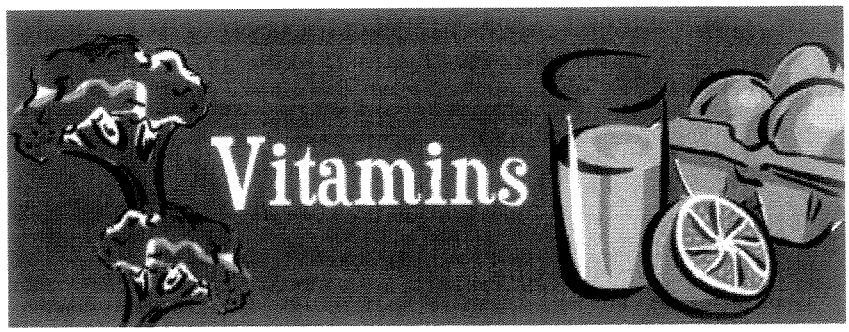
Movies & Games

Health Problems

Kids' Dictionary of Medical Words

Health Problems of Grown-Ups

En Español



KidsHealth>Kids>Staying Healthy>Fabulous Food>Vitamins

AAA Text Size

What's in this article? (click to view)

If you're like most kids, you've probably heard at least one parent say, "Don't forget to take your vitamin!" "Eat your salad — it's packed with vitamins!" But what exactly are vitamins?

Vitamins and minerals are substances that are found in foods we eat. Your body needs them to work properly, so you grow and develop just like you should. When it comes to vitamins, each one has a special role to play. For example:

- Vitamin D in milk helps your bones.
- Vitamin A in carrots helps you see at night.
- Vitamin C in oranges helps your body heal if you get a cut.
- B vitamins in leafy green vegetables help your body make protein and energy.

Vitamins Hang Out in Water and Fat

There are two types of vitamins: **fat soluble** and **water soluble**.

When you eat foods that contain fat-soluble vitamins, the vitamins are stored in the fat tissues in your body and in your liver. They wait around in your body fat until your body needs them.

Fat-soluble vitamins are happy to stay stored in your body for awhile — some stay for a few days, some for up to 6 months! The when it's time for them to be used, special carriers in your body take them to where they're needed. Vitamins A, D, E, and K are al fat-soluble vitamins.

Water-soluble vitamins are different. When you eat foods that hav water-soluble vitamins, the vitamins don't get stored as much in your body. Instead, they travel through your bloodstream. Whatever your body doesn't use comes out when you urinate (pee

5 Ways to Make Mom's Day

Swine Flu

The Way We Work:

Meet David Macaulay

Staying Connected: Savannah's Story

Nick Jonas & Diabetes: Call Me Mr. Positive

So these kinds of vitamins need to be replaced often because they don't stick around! This crowd of vitamins includes vitamin C and the big group of B vitamins — B1 (thiamin), B2 (riboflavin), niacin B6 (pyridoxine), folic acid, B12 (cobalamine), biotin, and pantothenic acid.

For Kids

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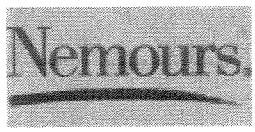

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Search here...

Kids Home

Feelings

Staying Healthy

Illnesses & Injuries

How the Body Works

Growing Body & Mind

Kids Talk

Cooking & Recipes

People, Places & Things That Help

Staying Safe

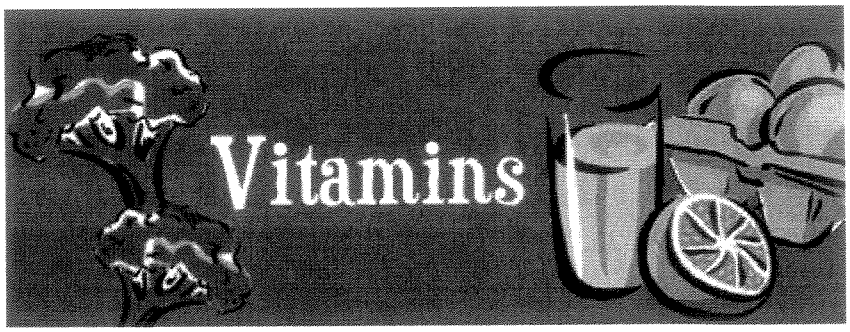
Movies & Games

Health Problems

Kids' Dictionary of Medical Words

Health Problems of Grown-Ups

En Español



KidsHealth>Kids>Staying Healthy>Fabulous Food>Vitamins

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What's in this article? (click to view)

Vitamins Feed Your Needs

Your body is one powerful machine, capable of doing all sorts of things by itself. But one thing it can't do is make vitamins. That's where food comes in. Your body is able to get the vitamins it need from the foods you eat because different foods contain different vitamins. The key is to eat different foods to get an assortment of vitamins. Though some kids take a daily vitamin, most kids don't need one if they're eating a variety of healthy foods.

Now, let's look more closely at vitamins — from A to K:

Vitamin A

This vitamin plays a really big part in eyesight. It's great for night vision, like when you're trick-or-treating on Halloween. Vitamin A helps you see in color, too, from the brightest yellow to the darke purple. In addition, it helps you grow properly and aids in healthy skin.

Which foods are rich in vitamin A?

- milk fortified with vitamin A
- liver
- orange fruits and vegetables (like cantaloupe, carrots, sweet potatoes)
- dark green leafy vegetables (like kale, collards, spinach)

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Swine Flu

The Way We Work:

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Figuring Out Food Labels

Search here...

Kids Home

Feelings

Staying Healthy

Illnesses & Injuries

How the Body Works

Growing Body & Mind

Kids Talk

Cooking & Recipes

People, Places & Things That Help

Staying Safe

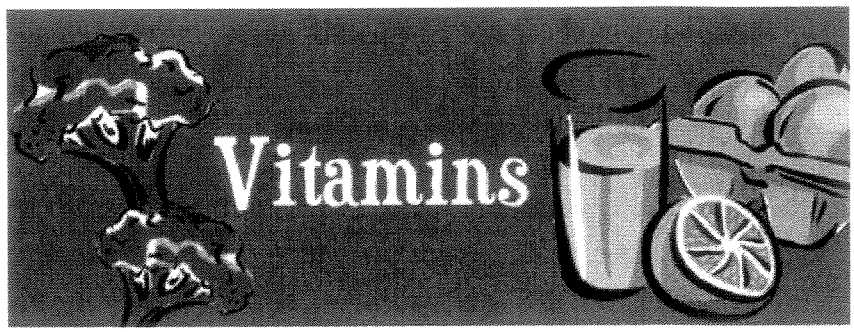
Movies & Games

Health Problems

Kids' Dictionary of Medical Words

Health Problems of Grown-Ups

En Español



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What's in this article? (click to view)

The B Vitamins

There's more than one B vitamin. Here's the list: B1, B2, B6, B12, niacin, folic acid, biotin, and pantothenic acid. Whew — that's quit a group!

The B vitamins are important in metabolic (say: meh-tuh-**bah**-lik) activity — this means that they help make energy and set it free when your body needs it. So the next time you're running to third base, thank those B vitamins. This group of vitamins is also involved in making red blood cells, which carry oxygen throughout your body. Every part of your body needs oxygen to work properly so these B vitamins have a really important job.

Which foods are rich in vitamin B?

- whole grains, such as wheat and oats
- fish and seafood
- poultry and meats
- eggs
- dairy products, like milk and yogurt
- leafy green vegetables
- beans and peas

Vitamin C

This vitamin is important for keeping body tissues, such as gums and muscles in good shape. C is also key if you get a cut or wound because it helps you heal. This vitamin also helps your body resist infection. This means that even though you can't always avoid getting sick, vitamin C makes it a little harder for your body to become infected with an illness.

Which foods are rich in vitamin C?

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Swine Flu

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- citrus fruits, like oranges
- cantaloupe
- strawberries
- tomatoes
- broccoli
- cabbage
- kiwi fruit
- sweet red peppers

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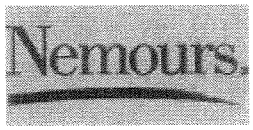

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Search here...

Kids Home

Feelings

Staying Healthy

Illnesses & Injuries

How the Body Works

Growing Body & Mind

Kids Talk

Cooking & Recipes

People, Places & Things That Help

Staying Safe

Movies & Games

Health Problems

Kids' Dictionary of Medical Words

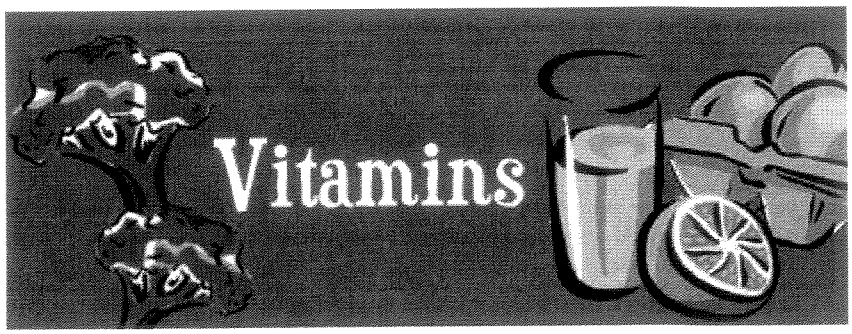
Health Problems of Grown-Ups

En Español

5 Ways to Make Mom's Day

Swine Flu

The Way We Work:



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What's in this article? (click to view)

Vitamin D

No bones about it . . . vitamin D is the vitamin you need for strong bones! It's also great for forming strong teeth. Vitamin D even lend a hand to an important mineral — it helps your body absorb the amount of calcium it needs.

Which foods are rich in vitamin D?

- milk fortified with vitamin D
- fish
- egg yolks
- liver
- fortified cereal

Vitamin E

Everybody needs E. This hard-working vitamin maintains a lot of your body's tissues, like the ones in your eyes, skin, and liver. It protects your lungs from becoming damaged by polluted air. And i is important for the formation of red blood cells.

Which foods are rich in vitamin E?

- whole grains, such as wheat and oats
- wheat germ
- leafy green vegetables
- sardines
- egg yolks
- nuts and seeds

Vitamin K

Vitamin K is the clotmaster! Remember the last time you got a cut

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Your blood did something special called clotting. This is when certain cells in your blood act like glue and stick together at the surface of the cut to help stop the bleeding.

Which foods are rich in vitamin K?

- leafy green vegetables
- dairy products, like milk and yogurt
- broccoli
- soybean oil

When your body gets this vitamin and the other ones it needs, you'll be feeling A-OK!

Reviewed by: Heidi Kecskemethy, RD, CSP
Date reviewed: September 2007
Originally reviewed by: Mary Frances Picciano, PhD

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Vocabulary List: Grades 6-8

ELA	Science	Math	Social Studies	Non-Content Specific
argumentation	abiotic/nonliving factors	algebraic expression	adaptation	apply
author's purpose	acid rain	altitude	agrarian society	boundary
bibliography	adaptations	angle bisector	agricultural	calculate
biography	air mass	area	assembly line	categorize
caption	animal development	array	assimilate/ assimilation	classify
character trait	asexual reproduction	axis of symmetry	authoritarian rule	compare
climax	asthenosphere	base	bourgeoisie	create
descriptive language	atmosphere	base 10	capitalism	describe
dialect	atoms	capacity	checks and balances	determine
editorial	bacteria	congruence	citizenship	develop
elaboration	barometric pressure	constant ratio	civil disobedience	device
empathy	beneficial relationships	coordinate system	civil service	devise
episode	binary fission	cube number	civilization	different
etymology	biological communities	cube root	colonization	digest
explicit	biomes	data set	conservatism	disadvantage
exposition	biosphere	estimate	corruption	disappointment
fact	biotic/living factors	experiment	custom	discern
fact vs. opinion	blizzards	exponent	depression	dominant
figurative	boundaries	frequency	desegregation	dramatize
figurative language	buoyancy	geometric formula	discrimination	draw conclusions
foreshadow	carnivore	grid	disenfranchisement	efficient
foreshadowing	celestial objects	growth rate	dissent	employ
generalization	cell	height	economics	entertain
historical fiction	cell division	integer	economy	environment
homonym	cell growth	intersecting lines	ethnic origin	equation
homophone	cell parts	length	emigrate	estimate
hyperbole	chemical reactions	minimum	enclave	ethics
idiom	climate	nonlinear equation	ethnic identity	evaluate
imagery	cloning	ordered pairs	ethnic minority	excerpt
implicit	competition	outliers	ethnocentrism	exchange
inference	complex machine	parallel figures	evolution	exclusion
interpretation	compound microscope	parallelogram	fascism	explain
irony	compounds	perfect square	financial	explicit
issue	compressional	perimeter	goods	extend
metaphor	conduction	perpendicular	green card	external
meter	conductivity	plane	hierarchy	extract
monologue (internal)	conservation	polygon	hostility	factual
offense	continent	prism	illegal alien	failure
offense	contraction	proportion	immigrate	feat
omniscient	convection	quadrilateral	imperialism	form
onomatopoeia	convection currents	range	industrialist	format
opinion	convergent	rate	industry	formation
paraphrase	core	rational number	interpretation	formulate
passion	crust	rectangle	intervention	generalization
personification	density	rectangular prism	isolationism	generate
perspective	dichotomous key	right angle	labor	however
persuasion	displace	Roman numeral	laissez faire	hypothesis

ELA	Science	Math	Social Studies	Non-Content Specific
plagiarism	divergent	root	liberty	hypothesize
point of view	DNA	rotation symmetry	lynching	identify
position	drought	square	manufacture	illustrate
pro vs. con	dynamic equilibrium	surface area	mass production	impact
prologue	Earth's axis	three-dimensional figure	mixed economy	imprint
protagonist	eclipses	triangle	monarchy	indicate
quotation	effect of elevation	two-dimensional figure	monastery	infer
resolution	egg	vertex	monopoly	interdependence
rhythm	electromagnetic energy	volume	mosque	observe
sarcasm	elements	width	nation-state	oppose
satire	endangered species		nativism	opposing
simile	endocrine system		naturalization	outline
symbolism	energy		neutrality	paraphrase
sympathy	energy conservation		nobility	preceding
syntax	energy pyramid		nomadic people	predict
tension	environmental concerns		patriarchal society	prefix
theme	environmental toxins		peasantry	pressure
thesis	epicenter		persecution	procedure
tone	erosion		perspective	qualification
transition	evolution		philanthropy/philanthropist	quality
verb tense	expansion		political alliance	rank
vignette	extensional		political party	rationale
voice	external environment		public opinion	rationalize
	extinction		push-pull factor	realization
	fault		rationing	reasonable
	faults		refugee	refute
	field map		robber baron	reinforce
	fold		rural	relationship
	food chain		scarcity	relative
	food web		secession	release
	force		segregation	relevance
	fossil record		services	remain
	friction		social status	represent
	gametes		sovereign state	require
	genes		spoils system	requirement
	genetic engineering		stereotype	resolve
	genetic expression		stratification	respond
	global warming		strike	response
	gravity		tariffs	reveal
	hardness		tenement	revolution
	harmful relationships		terrorism	rival
	herbivore		transportation	root
	heredity		trust-busting	rotation
	homeostasis		tycoon	scan
	hormonal regulation		union	secondary
	human body systems		urban	section
	human impact		urbanization	select
	hydrosphere		visa	signal
	igneous		wage	significance

ELA	Science	Math	Social Studies	Non-Content Specific
	immune system inertia infectious disease interdependence internal environment kinetic energy kingdoms latitude Law of Conservation of Energy light waves lithosphere locomotion longitude magnetism mantle matter Mendelian genetics metabolism metamorphic mixtures molecules molten motion multicellular multicellular organism mutations natural cycles natural resources Newton's First Law Newton's Second Law Newton's Third Law nutrients ocean basin oceanic omnivore organs overpopulation ozone depletion Pangaea parasites patterns of motion periodic table phases of matter phases of the moon photosynthesis plant development plants plate tectonics population growth potential energy			similarity skill sophisticated specify speculate spontaneous standard state statement stereotype structure study subsequent substitute successful suffix suggestion summarize support survey survive suspended symbol sympathetic system table text thesis timeline tradition transfer transformation type vague validity values variation Venn diagram viewpoint virtue

ELA	Science	Math	Social Studies	Non-Content Specific
	predator/prey relationship pressure probability Punnett square radiation recycle reflection refraction regulation relative humidity renewable sources of energy respiration Richter scale ring of fire rock classification rock cycle rotation seafloor seasonal variations sedimentary seismograph sexual reproduction simple machine solar system solubility solutions sound waves species sperm spreading streak thermoregulation tides tilt tissues topographic map topography transfer of heat transformation of energy trench unicellular unicellular organism unrenewable source of energy variation vegetative propagation vibration voltmeter water displacement weathering weather map			

Fitness and Health Activities

Participate in **30 or more minutes** of daily physical activity. Choose **at least three (3) activities** from the options below and the following calendars. There is something for everyone! Each one takes about 10 minutes. Increase your heart rate, improve flexibility, and build muscle strength!

If you have access to the Internet, you can track your physical activity by going to http://www.bam.gov/sub_physicalactivity/cal_index.asp, where you can create a customized physical activity calendar.

- Activity Calendar (in English and Spanish) – online at
  - http://www.aahperd.org/naspe/Toolbox/pdf_files/May09/Calendar_Sec_Eng.pdf (English)
  - http://www.aahperd.org/naspe/Toolbox/pdf_files/May09/Calendar_Sec_Span.pdf (Spanish)
- "10 at a Time" Activity Calendar – online at
  - http://www.aahperd.org/naspe/Toolbox/pdf_files/May09/Ten.pdf
- Small Space Energizers – online at
  - http://www.ncpublicschools.org/docs/curriculum/healthfulliving/resources/instructional/middleschoolenergizers/healthfuliving.pdf
- Muscle Strengthening Routine at Home – online at
  - http://cdc.gov/physicalactivity/everyone/videos/index.html
- Physical Activity Games – online at
  - http://www.kidnetic.com/Kore/

May 2009
Secondary Physical Activity Calendar

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	MilkPEP and the NBA teamed up to launch *Get Fit By Finals*, a new fitness and nutrition education initiative for teens. Visit www.MilkDelivers.org NOW to download a FREE *Get Fit* activation kit that includes a guide to implementing *Get Fit By Finals* in your school -- plus fitness and nutrition tips and tools from the NBA. **Log on by May 1 and tell us how you're getting your students fit and you could be eligible to WIN A GYM MAKEOVER FOR YOUR SCHOOL!** Also, check back to Web site weekly for new NBA player videos you can use in your classroom or gym to help motivate your students to get fit.				***1*** ***25 body squats w/ hands behind your head. Now 3 sets of as many push-ups as you can do.***	***2*** ***4 intervals, 15 min running, walk for 1 min between each interval.***
3 ***Get outside today with the family and go fly a kite!***	***4*** ***3 sets/15 reps bench press; 3 sets/ 15 reps tricep dips.***	***5*** ***Jump rope 2 min, fast walking 2 min, 12 minute run; repeat 3X.***	***6*** ***3 sets/15 reps body squats, then 3 sets/20 reps concentration curls.***	***7*** ***1 mile fitness run, sprint 50 yds, jog 50 yds- do this for 1 mile. Try again for a second fitness mile.***	***8*** ***3 sets /to tolerance, sitting overhead press. 3 sets/15 reps lying hamstring curl.***	***9*** ***4 sets/10 reps lying leg raises; 4 sets/10 reps lifting side plank.***
10 ***Go bowling today with friends or family. No lanes? Make pins from old 2 liter bottles filled w/sand or water.***	***11*** ***3 sets/12 reps inclined push-ups; 3 sets/15 reps tricep extensions.***	***12*** ***Yoga plank position- hold and raise each leg one at a time 10X. Repeat 2 more sets. 3 sets/12 reps toes to ceiling on bench.***	***13*** ***15 squat jumps with a ball extending overhead; 3 sets 15 reps one-arm row to both sides.***	***14*** ***2 min of ab work- basic crunches, crunches with legs up, twisting crunches. Repeat two more times.***	***15*** ***3 sets/15 reps stiff-legged dead lift; 3 sets/20 reps standing lateral raise.***	***16*** ***Speed play today: run, jog, run fast, walk, skip, run for a total of 40 min. Stretch afterward.***
17 ***Find 3 friends, go to the park and play 2 v. 2 volleyball.***	***18*** ***3 sets/12 reps declined push-ups; 3 sets/12 reps flyes.***	***19*** ***3 sets/20 reps knee tucks on a bench; 3 sets/15 reps reverse crunch.***	***20*** ***3 sets/20 reps bicep curl w/resistance; 3 sets/15 reps back extensions.***	***21*** ***Find a basketball and perform 4 sets of 25 crunches with the basketball held under your chin.***	***22*** ***Alternating walking lunges- 3 sets/20 reps; 4 sets/8 reps standing shoulder press.***	***23*** ***Ride a bicycle for one hr-pick a scenic route around town. Wear your helmet! No bike? One hr power walk/jog.***
24 ***Find a tennis court, play tennis for 30 minutes or hit against a wall.***	***25*** ***3 sets/10 reps wide arm push-ups; jump rope for 2 min in between each set.***	***26*** ***4 sets/10 reps twisting bench crunch; 10 min power walk in between each set.***	***27*** ***3 sets/15 reps superman; 3 sets/20 reps alternating bicep curls.***	***28*** ***How about some 3 on 3 basketball today?***	***29*** ***3 sets/20 reps calf raises off a step; 3 sets/ 15 reps seated overhead press.***	***30*** ***3 sets/15 reps single leg lift; 10 min. jog in between sets.***

May 2009
Ten At A Time Physical Activity Calendar

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Need help remembering exercises? Go to http://www.shapefit.com/training.html#8 for demos of exercises.	***Duplicated with permission from the National Association for Sport and Physical Education (NASPE). To assess whether your child is receiving a quality physical education program, visit www.naspeinfo.org/observePE for an observation assessment tool.***			*Each day lists one exercise that can be executed "10 at a time". Keep track of each set of 10 reps you accomplish throughout the day, or for cardio, ten minutes of the activity.*	***1 Squats w/ hands behind your head.***	***2 Power-walk 10 min.***
3 Tricep dips.	***4 Bench press.***	***5 Jump rope.***	***6 Concentration curls.***	***7 Lying hamstring curl.***	***8 Sitting overhead press.***	***9 Lying leg raise.***
10 Lifting side plank.	***11 Inclined push-ups.***	***12 Yoga plank position.***	***13 One-arm row to both sides.***	***14 Twisting crunches.***	***15 Stiff-legged dead lift.***	***16 Jump rope 10 min.***
17 Tricep extensions.	***18 Declined push-ups.***	***19 Knee tucks on a bench.***	***20 Bicep curl w/resistance.***	***21 Crunches with a basketball held under your chin.***	***22 Alternating walking lunges.***	***23 10 min power walk/jog.***
24 Toes to ceiling on bench.	***25 Wide arm push-ups.***	***26 Twisting bench crunch.***	***27 Superman.***	***28 Standing shoulder press.***	***29 Calf raises off a step.***	***30 Single leg lift.***

Arts Activities for Grades 6-8

A number of the activities listed reference specific works of art. If you are not familiar with them you may find them on the internet (even the performances). However, these are provided as examples, and you can substitute similar works of art with which you are familiar or to which you have access.

All Arts Activities taken from the *Blueprints for Teaching and Learning in the Arts: Grades PreK-12.*

DANCE

- Create a work using original movement material, devices to manipulate phrases, and a clear choreographic structure.
- Analyze how varying the use of force affects the way a movement feels, is perceived, and is interpreted.
- Maintain a dance journal, including dance research, dance resources and notation.
- Reflect upon personal criteria for evaluating dance, and share in discussion.
- Research the connections between two dance styles.
- Make a "family tree" of a dance form including major artists and dates of significant works.
- Research the period in which a choreographer was working or a dance form arose.
- Choose from a "grab bag of countries," and research the dances of the country chosen.
- Brainstorm the ways in which studying dance affects students' health.

MUSIC

- Listen to the folk song "Shenandoah," and write a private journal entry describing feelings evoked by the music.
- Share a recording or performance of a song from a particular culture that evokes a similar personal response.
- Compare at least two different settings of the same text in a choral work from online resources. Discuss specific similarities and differences in repertoire, such as: "Ave Maria" (Schubert, Byrd, others), "Still Nacht"/"Silent Night"(Gruber; German and English versions), "Anvil Chorus" (Verdi; Italian and English versions), "Toreador Song" (Bizet; French and English versions).
- Compare a jazz song performed by two different soloists— such as "Cherokee" (R. Noble) by Charlie Parker, Ella Fitzgerald, Wynton Marsalis, or others—listening for differences and similarities in "musical voice."
- Create a "Top 10 list" of favorite performers, repertoire representative of classical, world, jazz, and popular music styles and genres. Each item should be supported by a written explanation containing music vocabulary, where appropriate.
- Prepare a historical timeline reflecting world, national, state, or municipal events and their corresponding musical components.

THEATER

- Rehearse and perform a scene in front of others.
- Rehearse and perform the same scene in three distinct styles or genres such as situation comedy, reality show, soap opera, disaster movie.
- Research and portray a character, using at least one appropriate costume piece, prop, gesture, need and physical shape.
- Perform the written word in a reading or memorized presentation.
- Using original writing related to a specified theme, develop it into a monologue.

- Write a scene that has:
    - a plot comprising of a sequence of actions characters with clear intentions/wants
    - obstacles to characters' wants
    - character growth or transformation from overcoming an obstacle or resolving conflict
    - unified and consistent theme
    - written stage directions, including character descriptions and notes
    - clear and articulated choices about dramatic style, structure and convention
- Analyze a dramatic script for elements of structure, character development, conflict and plot.
- . Create a marketing poster for a show with an identifiable dominant image.
- Measure a room and create a ground plan including furniture and other elements from the room.
- Make a CD or audio tape to score a scene.

VISUAL ARTS

- Create a painting that demonstrates:
    - the rich use of a specific painting medium such as: watercolor, tempera or acrylic
    - awareness of light, value and contrast
    - strategies to depict the illusion of depth
    - use of prior observational sketches
- Create a pencil, conté, or pen and ink drawing that demonstrates:
    - perspective
    - observation of detail
    - scale of objects and figures
    - a wide range of values
    - a personal view
- Discuss techniques of perspective and scale, artist's choice in degree of detail, artist's message.
- Create a collage that demonstrates:
    - use of a variety of materials and textures
    - unity through color
    - balanced composition

Educational TV Shows

Channel	Show	Subject	Day	Time	Recommended Audience	Description
Discovery	How It's Made	Science, Engineering	Weekdays	9:00-10:00 AM	4-5, 6-8, 9-12	The show is a documentary program showing how common, everyday items (including food products like bubblegum, industrial products such as motors, musical instruments such as guitars, and sporting goods such as snowboards) are manufactured.
NYC TV - 25	Standard Deviants TV	ELA, Science, Mathematics	Weekdays	10:00 AM, 10:30 AM	6-8, 9-12	A fast-paced educational series for youngsters 12 and up, adapted from the "Standard Deviants" video series used in schools. The concept: break subjects (such as Shakespeare, astronomy and business law) down to their basic components and jazz them up with computer graphics, MTV-style production, and humor, which is supplied by the series' 12 young cohosts.
NYC TV - 25	Globe Trekker	Geography	Weekdays	1:00 PM	6-8, 9-12	Globe Trekker transports viewers to unforgettable destinations through its stunning photography, rhythmic indigenous music and spirit of adventure. In each episode, one vibrant young traveler ventures off-the-beaten path to soak up the local culture, sample the cuisine and revel in breathtaking vistas.
Animal Planet	Meerkat Manor	Nature	Weekdays	3:00 PM, 3:30 PM	6-8, 9-12	The series tells the story of the Whiskers, one of over a dozen families of meerkats in the Kalahari Desert being studied as part of the Kalahari Meerkat Project, a long-term field study into the ecological causes and evolutionary consequences of the cooperative nature of meerkats.

Channel	Show	Subject	Day	Time	Recommended Audience	Description
Discovery	Deadliest Catch	Nature	Weekdays	4:00 PM	6-8, 9-12	Deadliest Catch is a documentary television series that documents the events aboard fishing boats in the Bering Sea during the Alaskan king crab and Opilio crab fishing seasons. The Aleutian Islands port of Dutch Harbor (located in Unalaska, Alaska) is the base of operations for the fishing fleet. The show is named Deadliest Catch because the crew of these boats are at a high risk of injury or death.
Animal Planet	Growing Up	Nature	Weekday	4:00 PM	4-5, 6-8, 9-12	Each episode is an hour long and follows the life (usually the first year) of a wild animal growing up in captivity.
HBO OnDemand	Earth to Kids: A Guide to Products for a Healthy Planet	Science, Environmentalism	OnDemand	27 minutes	2-3, 4-5, 6-8	Making the Earth a better place to live is the focus of this special on reducing, reusing and recycling trash.